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Both Able and Willing.

AMERICA'S income is \$352 per capita; her debt, \$63. One hundred dollars per capita would bring \$12,000,000,000 and still leave us solvent. That is why we face the Fourth Liberty Loan with optimism and enthusiasm.

AMERICAN RUBBER TRADE ATTACKED.

CERTAIN publications in England, notably the "Financial Times" and "Truth," are saying exceeding bitter things against the American rubber trade. Noting them, our London contemporary, "The India Rubber Journal," states the case as follows:

"The excess raw rubber importation into the United States over and above the fixed ration has not yet been satisfactorily explained, and has provided food for much unfavorable discussion and comment in market circles. The usually well-informed financial correspondent of 'Truth' this week devotes his attention to the matter, and formulates an indictment against the American rubber industry which contains the essence of the market gossip. In order to ventilate the subject we reproduce his remarks below, and may perhaps go so

far as to say that some explanation is due from the American to the British rubber industry in order that any misunderstanding may be removed, and that the cordial relations which have ruled for so long be cemented."

Before replying fully we affirm that on the part of the American rubber trade there exists the most sincere and cordial feeling toward England. Her supreme sacrifices during the past four years in the defense of her heritage and ours, are fully appreciated and will never be forgotten.

As to the "indictment" in "Truth" which "The India Rubber Journal" cites, it begins:

"It would, of course, be as absurd as it is untrue to suggest that the United States Government has willingly become a party to a scheme, the object of which is to injure the British plantation industry."

This goes without saying. Why say it?

Continuing, "Truth" says:

"But that the Government import restrictions are being used to that end by a powerful and astute body of American manufacturers I have not the slightest doubt."

No such body exists: American rubber manufacturers buy for their own companies and not as a pool. Indeed their keen competition time and time again has forced the prices up to the advantage of the planter.

Still continuing, this is presented:

"For years it has been well known to the leaders of the rubber industry that American manufacturers—the consumers of two-thirds of the crop—are envious of our ownership of the Eastern plantations."

Here is a profound lack of understanding of American psychology. Few Americans spend time envying. Nor does the American rubber man have any feeling toward those who built up the planting industry but friendly appreciation. He realizes further that the work was not done from altruistic motives, and did not complain when during the rubber shortage a few years ago the planters got from him prices close to the three-dollar mark. Those same high prices, when he was on contract work, meant great financial loss, in some cases ruin, but he felt that the planter had a perfect right to sell for what he could get, and he paid without grumbling, and furthermore without any feeling against the English.

The indictment continues:

"At times, in fact, more or less open threats have been made that sooner or later they would make an effort to capture the plantations."

How does one "capture" plantations? By purchase? A "threat" to buy, granting that any financially responsible party made it, which we doubt, is not a crime. The seller need not sell. If he does, he gets value received. Furthermore the plantations would still doubtless remain on British territory, subject to British taxes and British laws.

Further on, this sin is laid on our shoulders.

"Year after year for the past seven years the Americans, as the largest buyers, have shown their power to control the price of this commodity. By first acquiring stocks, and then for a time standing out of the market, they have repeatedly been able to force timid and impudent growers to sell their crops at low prices."

So this is wrong, or at least unethical? One wonders if the planter ever holds his rubber for higher prices or raises prices when rubber is scarce?

Continuing, this annoying accusation is made:

"These clever American buyers no doubt welcomed—probably asked for—the restriction and licensing of rubber imports as the finest opportunity of securing cheap rubber that has ever been presented to them."

The "clever buyers" neither asked for nor welcomed the government restrictions. Indeed they protested strenuously against them, for it meant and still means great curtailment of business, a very serious matter for all.

Further says this writer:

"The absurd suggestion that the country could effectively play its part in the war and cut down its consumption of rubber from 180,000 tons to 100,000 tons was unfortunately believed in certain quarters here."

Many Americans wish the suggestion were absurd. The long list of "non-essentials" in rubber no longer to be manufactured; the stopping of automobile manufacture; the elimination of hundreds of styles of tires; the discontinuance of hundreds of styles of rubber footwear; the rule that of the 1,100 types of water bottles only three shall be manufactured, are but a few of the items that go to show that rubber manufacture, and rubber use are being curtailed. And be it noted, every division of the trade, through committees, is working hard at the problem of cutting down on rubber in every direction, and doing it with enthusiasm.

Another paragraph runs thus:

"Even now it is not too late to save the situation. Let the Rubber Growers' Association face the facts, and look below the surface of these 'restrictions' to the unfair advantage the American manufacturer is taking of war-time conditions in attempting to secure control of the plantation industry."

By all means let the Rubber Growers' Association face the facts. They are these.

1st. The excess rubber importation can be easily accounted for. It is due to Colonial shippers, amongst them some very prominent English firms, forwarding large weights of rubber without an import license regardless of the fact that one was required.

Positive knowledge is now in the possession of the War Trade Board of considerably more than 5,000 tons so shipped and some of the best known English firms are implicated.

However, when this is used as a basis by some of our English friends to insinuate American manufacturers have deceived the United States Government and are bringing in more rubber than the program calls for, then it is about time to make it clearly evident who are

responsible for the excess importations over the prescribed schedule.

Here is a statement of the actual facts.

The amount of rubber actually licensed for importation by the Bureau of Imports of the War Trade Board from May 8 to September 23 was 40,044 tons shipping weight or, after making allowances for the shrinkage allowed on Brazilian rubbers, say 36,000 tons dry weight.

Therefore, the allocation program of 100,000 tons per annum is certainly being strictly lived up to.

Any weight beyond the above amount that has been shipped after May 8, is unlicensed rubber, cannot be entered for consumption until it is licensed, and when it is, it will apply against the schedule.

In other words, where provision is made for licensing 25,000 tons during the forthcoming quarter, not all of this by any means will leave overseas points.

The War Trade Board intends that this unlicensed rubber shall be taken care of. Consequently shipments from overseas during the next three months are likely to be slender indeed, particularly as the War Trade Board is not likely to deal leniently from this date, now that their import regulations are so well known, and any offender who persists in shipping without a license is liable to find himself in an uncomfortable situation.

Assuming that the importations of crude rubber during 1917 amounted to approximately 180,000 long tons, the actual consumption during 1917, as determined by a very careful census and backed up by sworn statements from substantially all the manufacturers, indicate an actual consumption of 330,653,640 pounds or say 147,613 long tons.

Stocks on hand and in transit to the United States,
December 31, 1917..... 67,535 tons.
Stocks on hand and in transit March 31, 1918..... 87,572 tons
Stocks on hand and in transit July 31, 1918..... 77,413 tons

During August and September, the output of pneumatic tires was limited to 50 per cent of the manufacturer's 1917 production. For the forthcoming quarter of October-December, the same restriction applies and in addition thereto the manufacture of more or less non-essential articles is to be either eliminated or heavily curtailed.

It is our best judgment that the total consumption during the forthcoming quarter will not exceed 32,000 tons against 25,000 tons to be licensed.

The reduction of 7,000 tons in stock can be sustained by reason of the heavy weights on hand and in transit, as indicated.

2nd. The news of American restrictions brought about a bear market in the Far East. Some American and some English rubber manufacturers doubtless purchased largely at low figures. They will have to store the rubber in a tropical country perhaps for years, a costly proceeding. They took a risk that the planter did not wish to take.

3rd. The American rubber industry is straining every nerve to win the war. Its best plants are already on war work; its best men are in war work, thousands of its young men are in the Army. It is giving up time, money and effort to the limit and gladly.

4th. The record of the American rubber trade in its crude rubber dealings is unsurpassed for unfaltering fairness. At the beginning of the war England declared an embargo on crude rubber to keep it from the Central Powers. The American rubber trade through the Rubber Association agreed to buy only for its own uses and the embargo was lifted. The Association through its committees, its information service, and its legal advisers, saw to it that this agreement was kept to the letter. It involved the expenditure of thousands of dollars, the fighting of law suits instituted by Germans, and unremitting watchfulness. The result was that in spite of Teutonic money and ingenuity, so little rubber got away that figured in percentages it would be in the hundredths of one per cent. America did it for her own manufacturers, but it accrued to the signal advantage of the British planters at a time when the German and the Austrian market was closed to them.

In conclusion, "Truth" says:

"If there is to be a fight for control, by all means let the share-holder be told. He will play his part willingly and ungrudgingly, and so far from shrinking from the struggle I shall be surprised if he does not enjoy it."

Less than one per cent of the purchasers of plantation rubber in the United States have any financial interest in plantations in British possessions. Rubber shares are not listed or known in the United States. Of the rubber manufacturers in America 99 per cent do not know whether "Batu Caves" and "Vallambrosa" are tropical diseases or African lakes. Speaking of attempts at control when a resident of Shanghai approached American rubber interests with a project to corral the shares of all of the plantation companies registered there, he received not the slightest encouragement. It did not interest them, nor does the control of any set of plantations interest the American.

We realize fully that the rubber planting industry in the Far East is the favorite child of the British Empire. In the beginning, planting methods, "wound response," tapping and coagulating, were all discovered and developed by government experts. As the industry grew it was watched, guarded, disease fought, and assistance given, to a degree hitherto unknown in agriculture. Moreover taxes on the rubber produced were kept very low, so low that the world wondered. The growth of the planting interest was largely due to the tremendous development of the motor industry, and America became by far the largest customer. For years rubber that cost the planter 25 cents a pound was sold to the manufacturer never below \$1 and for a time for more than \$2 a pound, showing profits of 300 to 600 per cent.

The actual owners of the great and profitable planta-

tions are the shareholders found in all walks in English life. That Americans for a moment thought of trying to dispossess them is a statement wholly without basis of fact and comes from those who are friends neither of the American manufacturer nor the British shareholder. It is to the distinct advantage of the American rubber trade to keep the plantation industry of the Far East in its present capable hands, and it stands ready to do whatever lies in its power to help to that end.

The financial end of planting from the beginning rested primarily and chiefly in London. Here a host of promoters launched planting projects, bought and sold rubber shares, and made much money. These men were the objectors when a few, a very few, Americans purchased plantations of their own. They alone fostered the alarm concerning the "American invasion." They also were the objectors to direct buying, say between Singapore and New York, simply because their London commission was thus cut off. From them came floods of suggestions for curtailing plantation production, for the purchase of surplus stocks, for valorization, for working agreements with Brazilian exporters, all to keep shares abnormally high. Not for one moment did they consider the interests of their big customers or attempt to insure the future of the planter by giving such advantages that it would profit the buyer to remain a customer for all time. They took everything, gave nothing. They are the friends and protectors of none. During the "rubber craze" they unloaded barren properties, as "Filisola," on English widows and orphans without qualm.

The recent attack upon Americans in the London papers emanates, not from the planter in the East, nor from the British rubber trade, but from this financial set. It is designed to bolster prices of rubber shares, and is indifferent to facts, and callous as to its effect upon American or English feeling, or to the joy it will give the Germans.

That reputable English journals should publish its untruthful screeds, and practically stand sponsor for them, is incomprehensible.

THE TWO, THREE, AND PERHAPS NINE-HOLE GOLF COURSES that may be installed in the rear of the American Army on the Western Front promise to be the sportiest in the world. What with shell craters, ruined villages, barbed wire bunkers and various other Hun hazards, real golfers will have the time of their lives. A golf ball with iron cross markings would be hit with great accuracy and vigor.

THE AKRON RUBBER WORKERS' OATH OF ALLEGIANCE.

I will stick to my job and do an honest day's work every day for the duration of the war. So help me God.

THE BRISTOL RUBBER RIOTERS' OATH OF ALLEGIANCE.

I will throw up my job or do a dishonest day's work every day for the duration of the war. So help me Gott.

War News of the Rubber Industry.

Liberty Day, October 12. The Fourth Liberty Loan and the Rainbow Division. War Regulation of Rubber Footwear Production. Government Courses in Employment Management. Manufacturers of Compounding Ingredients Ask Priority. Colors of Canvas Shoe Fabric Limited. New Clothing Branch in the Quartermaster Corps. Textile Division Sections of the War Industries Board. Saves One Million Feet of Vacuum Cleaner Hose. From a Former Belgian Rubber Official. Coal Storage Limited. Stenographers and Typists Wanted by Government. Drive of \$170,500,000 for Welfare Work. Rubber Gas Bombs Dropped Over American Trenches. Improved Equipment Increases Number of Women Tire Workers. Waterproofer Organize to Speed Up Government Work. Skilled Mechanics for Air Service. Salvage of Rubber at the Front. Fixed-Price Contracts for Army Supplies. "Hypatia" to Aid Red Cross. Service Notes and Personals. Martyrs to the Cause of Liberty.

LIBERTY DAY, OCTOBER 12.

BY Presidential proclamation, October 12, the 426th anniversary of the discovery of America, has been proclaimed as Liberty Day in order to stimulate a generous response to the Fourth Liberty Loan. Every community is urged to commemorate the day by patriotic addresses, parades, pageants, etc., under the direction of the nearest Liberty Loan committee.

THE FOURTH LIBERTY LOAN AND THE RAINBOW DIVISION.

The Fourth Liberty Loan drive began in New York on the evening of September 27, although the scheduled opening of the drive proper was not until the following morning, with the blowing of sirens and whistles as a preliminary to the address of President Wilson at the Metropolitan Opera House.

Previous to this, however, the Rainbow Division of the Special Liberty Loan Committee of the Rubber Trade of Greater New York held a meeting in the afternoon at the Yale Club, presided over by F. E. Titus, the secretary of the committee. Addresses were made by J. N. Gunn, chairman of the Tire Division Committee; by Secretary of War Baker, and by Mr. Sachs, of Goldman, Sachs & Co.

On the morning of September 28, flag-raising exercises were held at City Hall, while two parades started, one south from 51st street and the other north from Bowling Green.

In the afternoon, a 12-passenger Caproni "bombed" the city with a ton of circulars urging subscription to the Loan.

The total amount for which the Fourth Loan is set is \$6,000,000,000, as tentatively proposed, on which interest will be paid at the rate of 4 1/4 per cent. New York's quota for the Fourth Liberty Loan is \$1,800,000,000, or 30 per cent of the entire amount. Over \$200,000,000 was subscribed the first day. October 19 is the closing date for the receipt of subscriptions.

Books similar to the coupon books used in the Third Liberty Loan drive will be used again in New York City, this time to have \$2-receipts affixed by the receiving banks when subscribers make their payments. Subscribers are also urged to buy registered bonds, for protection, and hold them until maturity.

Further details of participation in the Fourth Liberty Loan drive by organizations connected with the rubber industry will appear in our November issue.

WAR REGULATION OF RUBBER FOOTWEAR PRODUCTION.

The Conservation Division of the War Industries Board in conference with representatives of the manufacturers, has authorized curtailment regulations and restrictions in the manufacture of rubber and tennis footwear, to become effective September 1, on tennis lines, and January 1, on rubber footwear.

The tennis lines had in a previous order been restricted to a few colors of duck fabric, the fancy colors and some excessive heights of boots being eliminated. In rubber footwear, the new schedule is claimed to eliminate, for the period of the war, 5,500 styles of rubber footwear, but the only way in which such a number can be reached is by counting duplicate lines known under different names by the competing manufacturers, and by counting each size and width as a "style."

The order restricts the introduction of new lasts other than as required by the Government or to meet changes in leather footwear styles. The manufacture of men's hip and sporting rubber boots is to be restricted to one grade only, and all duck boots to be discontinued as far as possible. Leather insoles in all boots will be discontinued. Women's, boys' and youths'

hip and sporting boots will not be manufactured at all. The manufacture of knee boots will be discontinued.

Reductions in styles include the limiting of rolled-edge arctics and gaiters to men's sizes; and discontinuance of first-quality all-rubber gaiters, "Omaha" arctics and excluders, misses' and children's snow excluders, boys' and youths' jersey-cloth arctics; motormen's gaiters for men; plow shoes; lumbermen's high-lace duck vamps with gum uppers; all two-buckle jersey cloth gaiters; men's one-strap (instep) sandals; all plain sandals and self-acting sandals and "croquet" with fleece lining (storm patterns not included); self-acting storm patterns; Russian rubbers, low vamp Alaskas (not storm patterns); boys' and youths' Alaskas; clogs; youths' self-acting sandals; all self-acting Alaskas.

Buckle gaiters are not to be made higher than the present 4-buckle height in men's, boys' and youths', and the 3-buckle height in women's, misses' and children's. The manufacture of jersey-cloth gaiters and Alaskas authorized is to be restricted to first and extra quality. Use of flour starch or similar finish is greatly restricted; cashmerettes or so-called heavy arctics or gaiters and canvas rubber-soled shoes are not to be varnished; dyed linings, except where fleece-lined, are to be discontinued. All use of caustic soda in the manufacture of rubber footwear is to stop.

It is estimated by the Conservation Division that this program will conserve, among other things, 29,012,600 cartons; 5,245,300 square feet of lumber; 1,526,493 square feet of shipping and storage space; 10,742,517 pounds of weight (freight) or 4,795 tons; 2,250,272 pounds of material that will not have to be dyed; 74,750 pounds of flour starch; 30,380 gallons of varnish; 125,300 pounds of tissue paper; 49,617 days' labor that may be diverted to more essential work.

GOVERNMENT COURSES IN EMPLOYMENT MANAGEMENT.

The Government has found it necessary to enter the field of industrial education on a large scale. War Emergency Courses in Employment Management, conducted by the Employment Management Division of the War Industries Board, under the auspices of five governmental departments, have been arranged for in nine leading universities in various parts of the country. These courses are designed to train men and women, who already have a basic experience of at least three years in industrial life and factory methods, and have therefore come in actual contact with shop problems. In these days every laborer must do the thing for which he is best fitted, and it has been proved that an experienced employment manager, in charge of all hiring and firing, comes very near to solving the labor problem. Manufacturers are expected to make the best use of the labor with which they are supplied, and it is through standardization of the services of an efficient central employment department that this is being accomplished in large plants. Employers of labor, particularly those having war contracts, are urged to suggest men or women from their own organizations as candidates. The courses run from six to eight weeks, and there are no charges, except the outlay for living expenses and about \$15 for books and supplies. Complete information may be obtained by addressing Captain Boyd Fisher, 717 Thirteenth street, N. W., Washington, District of Columbia.

The Hood Rubber Co., Watertown, Massachusetts; United States Rubber Co., New York City, and The Goodyear's Metallic Rubber Shoe Co., Naugatuck, Connecticut, were represented by students in previous courses, and among miscellaneous industries represented may be mentioned The Barrett Co., New York City, and the General Electric Co., Schenectady, New York.

MANUFACTURERS OF COMPOUNDING INGREDIENTS ASK PRIORITY.

The War Conference Committee of the Paint, Varnish and Allied Industries is presenting a memorial to the War Industries Board setting forth the claims of these industries to the right to be considered essential and thus be granted priority preference in fuel, labor and freight. Among the members of this committee well known to the rubber trade may be mentioned H. Gates for R. W. Evans of the Eagle-Picher Lead Co., Chicago, Illinois, representing the lead pigment industry; C. K. Williams of C. K. Williams & Co., Easton, Pennsylvania, and Henry C. Stewart of the Westmoreland Chemical & Color Co., Philadelphia, Pennsylvania, representing the dry paint and pigments industry; E. V. Peters of the New Jersey Zinc Co., New York City, representing the zinc oxide industry; C. L. Krebs of the Krebs Pigment & Chemical Co., Newport, Delaware, and S. B. Woodbridge of E. I. du Pont de Nemours & Co., New York City, representing the lithopone industry.

COLORS OF CANVAS SHOE FABRIC LIMITED.

The War Industries Board has decided after October 1 to limit the colors of dark fabrics for canvas shoes to the following, as represented on the Standard Color Card of America:

Olive-brown, S-4856, cable No. 107, which represents the dark brown or tan.

Ecru, S-3183, cable No. 29 which represents the medium brown or tan.

All finished stocks of duck fabrics in the hands of fabric manufacturers and shoe manufacturers may be disposed of in the ordinary course of business. But on and after this date fabric manufacturers should produce for canvas shoes duck fabrics of only the colors recommended.

NEW CLOTHING BRANCH IN THE QUARTERMASTER CORPS.

The Quartermaster Corps announces the establishment of a new branch in the clothing and equipage division, which is to be known as the research and specifications branch. It will connect the procurement of supplies with their consumption and actual use, and will also pass on all specifications submitted by procurement officers. No departure from specifications in case of emergency will be made without the approval of the research and specifications branch.

The establishment of this branch is expected to prove of great value, not only to the Quartermaster Corps but also to the manufacturers and contractors who are supplying equipment for the Army.

TEXTILE DIVISION SECTIONS OF THE WAR INDUSTRIES BOARD.

What was formerly known as the supplies section of the Textile Division of the War Industries Board has been replaced by eleven sections. Following is a list of those of interest to the rubber industry, with their addresses in Washington, District of Columbia:

Rubber section, E. A. Saunders (advisory);

Rubber goods section, A. W. Lawrence, chief, room 411, Quartermaster Corps Building;

Cotton goods section, Spencer Turner, chief, room 39, Annex;

Knit goods section, Lincoln Cromwell, chief, room 41, Quartermaster Corps Building.

SAVES ONE MILLION FEET OF VACUUM CLEANER HOSE.

Manufacturers of power-driven portable vacuum cleaners are cooperating with the Conservation Division of the War Industries Board by limiting their lines to not more than two models or sizes, by discontinuing less essential equipment, and by substituting other material for metal where the latter is not absolute necessary. It is estimated that these measures will result in the saving annually of 100 tons of steel, 125 tons of aluminum, five tons of brass, and 1,000,000 feet of rubber hose.

FROM A FORMER BELGIAN RUBBER OFFICIAL.

Major Leon Osterreith, formerly a prominent rubber merchant in Antwerp and delegate from Belgium to the International Rubber and Allied Trades Exhibitions of 1911 and 1914, now Belgian military attaché and chief of the Belgian military mission to this country, speaks with confidence and enthusiasm regarding the complete reorganization of the Belgian army while holding its line under fire at the front. Said he:

Without going into details, the Belgian Army has up-to-date infantry, cavalry and artillery; schools for officers and training camps for soldiers, as well as bombing, sniping, machine-gun, aviation, signaling and trench-mortar instruction centers.

The present Belgian Army, composed of six divisions, one cavalry corps, very powerful artillery of all caliber, numerous machine guns and up-to-date trench material and splendid flying corps, is stronger than ever, and impatiently awaits the order to advance.

COAL STORAGE LIMITED.

The tremendously increasing demand for coal for special war purposes in the eastern part of the country has made it necessary for the Fuel Administration to limit the amount of coal that industrial plants may carry on hand in storage in most states east of the Mississippi. That part of the bituminous steam coal schedule of particular interest to the rubber and allied non-preferred industries follows: Massachusetts, northern New York, 30 days; Rhode Island, Connecticut, eastern Ohio, lower Michigan, 20 days; southern New York, New Jersey, Delaware, eastern Pennsylvania, western Ohio, 15 days. State fuel administrators have authority to grant increased supplies in particular cases requiring special treatment, however.

STENOGRAPHERS AND TYPISTS WANTED BY GOVERNMENT.

Many stenographers and typists are still needed in the Government Offices at Washington, District of Columbia. Rubber companies can perform a patriotic service by making this known to their employes; by encouraging apt young women without the required training to undergo instruction at once, and, if possible, by assisting them in this. Full information and application blanks may be obtained from the secretary of the local board of Civil Service Examiners at the postoffice or customhouse in any important city.

DRIVE OF \$170,500,000 FOR WELFARE WORK.

With the approval of the War Department a combined non-sectarian drive for a war fund of \$170,500,000 for use in support of the seven organizations engaged in welfare work with the American expeditionary forces will begin the week of November 11. This sum will be divided according to the needs of each organization as follows: Young Men's Christian Association, \$100,000,000; Young Women's Christian Association, \$15,000,000; National Catholic War Council (including the Knights of Columbus and special activities for women), \$30,000,000; Jewish Welfare Board, \$3,500,000; American Library Association, \$3,500,000; War Camp Community Service, \$15,000,000; Salvation Army, \$3,500,000.

With the entire country behind this beneficent movement, the success of the drive may be confidently anticipated, and as in the past the rubber industry will do its full share.

RUBBER GAS BOMBS DROPPED OVER AMERICAN TRENCHES.

Interesting news items from the American army in France mention a German airplane flying over the sector northwest of Toul as having dropped rubber balls eighteen inches in diameter and filled with liquefied mustard gas. The effect of the gas was not serious, but the American troops were enraged by what they termed the "dirty warfare." These were probably the rubber-based bouncing bombs described in THE INDIA RUBBER WORLD of January 1, 1918, or a modification of them. Leather and rope were relied upon fully as much as rubber for the resiliency of the first of these German bombs, and the rubber used was, of course, either reclaimed, or synthetic and pro-

duced at great cost. After more than three and one-half years of warfare the rubber situation in Germany has become such that the production of munitions dependent on rubber will hardly become an increasing menace to the allied cause.

IMPROVED EQUIPMENT INCREASES NUMBER OF WOMEN TIRE WORKERS.

At the Morgan & Wright plant of the United States Tire Co., Detroit, Michigan, some 500 women are now employed in many departments where the work taxed the endurance of the able-bodied men who formerly did it.

Improved equipment, however, is constantly reducing the amount of physical exertion required by the various operations in tire building. For example, with the aid of a lifting jack—a



WITH THE AID OF A LIFTING JACK, WOMEN BECOME EFFICIENT TIRE-FINISHERS.

device developed from the idea of an employe—the physical effort required for the work in the finishing room has been reduced to such a degree that women are now employed on 3, 3½ and 4-inch tires.

The tires are brought into the department on trucks which are fitted with T-shaped steel uprights from which the tires are suspended. When the worker is ready to start on a new tire she approaches the loaded truck with a lifting jack. Upon turning a wheel at one side an arm is raised. This is guided under the nearest tire, lifting it off the T-shaped fixture on the truck. The lifting device, which is mounted on casters, is then pushed to the worker's bench; the tire is lowered, and transferred to the finishing bench. The plies of fabric and the gum strips are then applied by hand in the usual manner, rolled and the edges cut. The lifting jack is again used in removing the tire and placing it on a truck.

Women have completely replaced men in supplying stock to the workers in the finishing room. The coils of wire for pneumatic tire beads are made and soldered by women, also wrapped and trimmed. Many women are employed in the pocket department where pieces of fabric are taken from books about eight feet long, cut to the required length and stretched, one layer above another, over a large drum of equal circumference until a certain thickness is attained. These bands are then removed from the drum and conveyed to another department, where they are put over a tire core by men. As the books are too heavy for women to carry, men supply the workers as needed.

In other departments where women are employed the work is of lighter character. A number of women are engaged in cutting treads; several trim the uneven fabric edges from the rubber tread, while others cement the ends together; another group makes patches for repair kits; still others stamp sizes and names on inner tubes, and others work in the packing room where the

product is boxed. Numerous women are engaged as inspectors in various departments. As the finished casings are finally inspected they are sent to women who check their serial numbers and weigh each tire.

The vestibule school system of training has proved unsuccessful in the rubber industry, and it has been found preferable to train students among the other workers, as they develop and grasp efficient methods and short cuts more rapidly. Women are quicker to learn than men, and are taken out of the student class after six or seven weeks. Excepting the students, the women receive the same rate of pay as the men, but in the aggregate their earnings average slightly less.

Special rest and locker rooms are provided, to which the women may retire at any time. A matron is constantly on duty and aims to make the women feel as much at home as possible and to be with them during the luncheon hour.

WATERPROOFERS ORGANIZE TO SPEED UP GOVERNMENT WORK.

To speed up waterproofing work for the army, the waterproofers have formed an advisory body to be known as the Waterproofers' Committee of the Naval Consulting Board.

The members comprise V. G. Guinzburg, I. B. Kleinert Rubber Co., New York City; R. K. Goodlatt, T. R. Goodlatt & Son, Delaware, New York; W. B. Price, Price Fire & Waterproofing Co., Poughkeepsie, New York, and Herbert P. Pearson, general manager of the Cravenette Co., New York City, who is chairman of the committee.

SKILLED MECHANICS FOR AIR SERVICE.

The Air Service Division of the United States Army requires 4,000 skilled mechanics, between 18 and 56. Men qualified in the following trades are particularly sought: airplane mechanics, carpenters, coppersmiths, instrument men, motor cyclists, vulcanizers, blacksmiths, cabinetmakers, chauffeurs, fabric workers, truck masters, welders, propeller makers, motor mechanics, and machinists. Applications may be made any day between 8 a. m. and 5 p. m. to Lieutenant Billker, Room 902, 104 Broad street, New York City.

SALVAGE OF RUBBER AT THE FRONT.

At the Salvage Depot of American Supply Headquarters in France about 1,000 pairs of rubber boots and arctics are being salvaged daily. The salvage of all kinds of rubber articles was 99 per cent, or almost a complete saving of everything received. The value of the rubber salvaged last month was \$90,000. This includes the articles abandoned by the retreating enemy and by the Allied troops when hastily transferred and forced to leave extra clothing, etc., behind.

FIXED-PRICE CONTRACTS FOR ARMY SUPPLIES.

The War Department announces that wherever possible, fixed-price contracts will hereafter be the rule in the purchase of army supplies. In exceptional cases, where it is clearly to the advantage of the government, a cost plus fixed compensation contract will be made, subject to the approval of both the board of review of the particular supply bureau concerned and the Superior Board of Review of the General Staff.

"HYPATIA" TO AID RED CROSS.

J. H. Stedman of the Monatiquot Rubber Works Co., South Braintree, Massachusetts, has donated the "Hypatia" to the Red Cross, which will sell her and devote the proceeds to war work. Originally she was a full-rigged sloop measuring about 50 feet, with a 15-foot beam. In recent years a heavy-duty gas-engine was installed. At the beginning of the war, Mr. Stedman offered her to the Government for patrol purposes and she was temporarily accepted but later released as not needed.

SERVICE NOTES AND PERSONALS.

Dr. Lothar E. Weber, known to rubber manufacturers generally through his excellent work as consulting rubber chemist, is connected with the Conservation Division of the War Industries Board at Washington. As part of the program for conserving sulphuric acid, the Board for some time has been urging the substitution of nitre cake wherever possible. It was in furtherance of this work that Dr. Weber addressed the reclaimers at their meeting at Point Shirley not long ago.

Edwin H. Kidder, manager of the Boston branch of the United States Tire Co., has been given leave of absence that he may join the personnel board of the Emergency Fleet Corporation at Philadelphia. He will probably visit the various shipyards, and later go to Paris for similar duties abroad. The United States Tire Co. will appoint a temporary manager to fill the position for the duration of the war.

Major M. C. Rector of the Medical Corps, now stationed at a base hospital in France with the American Expeditionary Forces, is a member of the executive committee of the Sterling Tire Corp., Rutherford, New Jersey. He has been decorated several times.

Major Frank R. Bacon, president of the Cutler-Hammer Manufacturing Co., Milwaukee, Wisconsin, which manufactures electric-control devices, has been

detailed to Chicago as Assistant Ordnance District Chief of the Chicago District, and will have under his supervision all ordnance manufacture in northern Illinois, northern Indiana, Wisconsin, Iowa, Minnesota, North and South Dakota, and Montana.

Harry W. Bacon, manager of the Detroit office of the Dural Rubber Corp., Flemington, New Jersey, has been accepted for flying commission. He received his aeronautical training two years ago in Southern California.



YVONNE CAIJO.

Dr. M. M. Harrison, head of the research department, has been granted leave of absence by the Miller Rubber Co., Akron, Ohio, to accept a captaincy in the Chemical Warfare Service, National Army.

Aviator Lieutenant Don Harris, a former employe of The Goodyear Tire & Rubber Co., Akron, Ohio, has been interned in Holland for the duration of the war, following his descent for repairs, after an attack by German anti-aircraft guns, when he was unable to get back to the American lines.

Alexander Dow, tire inventor and rubber man, is a captain

in the Ordnance Department and assigned to the Western Cartridge Co., East Alton, Illinois, in charge of matters pertaining to production, approval of contracts, and purchase of materials for plant extension.

Rawson R. Cowen, of the E. H. Clapp Rubber Co., Boston, Massachusetts, is now preparing for war service at the Artillery Officers' Training School, Camp Zachary Taylor, Louisville, Kentucky. Mr. Cowen is the son of the late Robert Cowen, of the Boston Hose and Rubber Co. He is a graduate of Harvard University, of the class of 1916, and has been on the force of the E. H. Clapp Rubber Co. since that year. Mr. Cowen is a husky individual, well fitted to do his bit for his country. He was a football player during his college days, and for three years was a member of the All-American team.

I. R. Martin, former athletic director at The Goodyear Tire & Rubber Co., Akron, Ohio, and well-known in college circles as an athletic trainer, recently entered the Massachusetts Institute of Technology, Boston, Massachusetts, to train as a seaplane operator. He has also been a student at Harvard and at William Jewell College.

D. Warren Boyer, of Trenton, New Jersey, who has been connected with the Philadelphia branch of the Ajax Rubber Co. for the past nine years, is now a chief petty officer aboard a submarine chaser. He is stationed at Pensacola, Florida, and is on duty in the Gulf of Mexico. He enlisted a year ago after spending some time in a training school at Columbia University, New York City.

MARTYRS TO THE CAUSE OF LIBERTY.

FIRST LIEUTENANT DAVID ENDICOTT PUTNAM, America's ace of aces, whose portrait appeared in the July number of **THE INDIA RUBBER WORLD**, was recently killed in action in the air over Limey, France, when he was attacked by seven German airplanes. He is said to have destroyed 20 enemy machines. In one action, he shot down five German planes within half an hour. He had been cited for bravery in United States official orders a number of times, and had been awarded the Croix de Guerre by the French Government. Lieutenant Putnam was a descendant of one of the oldest American colonial families. He is survived by his mother and three sisters. Lieutenant Putnam was a member of the class of 1920 of Harvard University.

The Great War takes its toll not only at the front but right here at home as well. A peculiarly sad case was the death of Howard Stokes Boyer, son of H. L. Boyer, secretary of the Joseph Stokes Rubber Co., Trenton, New Jersey. Young Boyer, who was but twenty years old and a fine upstanding boy, full of life and patriotism, had joined the Aviation Section and was in training in Massachusetts. To use his own words, he felt that he could make his "star shine brighter in aviation than in any other branch of the service." A friend of all, a brilliant student in the chosen line, assured of quick promotion, he was stricken with influenza and died in the hospital camp. He gave his life for his country, a hero, a patriot, and a martyr to the great cause.



H. S. BOYER.

Four more gold stars will be added to the service flag of The B. F. Goodrich Co., Akron, Ohio. Owen Hopkins, after being wounded in France and returned to Newport News, contracted diphtheria to which he shortly succumbed. George Minford is reported to have been drowned during a sea fight, and Thomas Wallace, to have been killed in action with the Canadian forces in France, while Oscar W. Zuelsdorf, a former inspector in Department 16-A, died in July as the result of wounds received in the trenches.

Corporal Vincent Matthews Bowes, formerly a member of the organization of the Sterling Tire Corp., Rutherford, New Jersey, in Syracuse, New York, recently was killed in action in France. He was with Company M, 104th Infantry.

SALE OF BREWERS' RUBBER GOODS TO CEASE.

On December 1, 1918, twelve hundred breweries in the United States, representing an investment of \$2,000,000,000, and employing 100,000 workers, will cease brewing operations for at least the duration of the war.

The list of rubber goods that will be affected by the Government's closing order is a large one and includes brewers' hose, power and conveyor belting, solid tires, packing, special gaskets, tubing, rubber boots and aprons, bottle brushes, sealing plugs and electric insulation. As tires comprise the largest item in this list, it is of interest to note that 3,600 trucks equipped with 21,600 solid rubber tires valued at \$1,620,000 are used in this industry.

While the loss of brewers' business would appear to be imminent, the fact that many brewing plants are to be turned into cold storage plants requiring motor trucks and mechanical rubber goods, is a redeeming feature. Moreover, the effect of business loss will be mitigated by Government priority orders for solid tires and mechanical goods that are keeping the manufacturers busy at present.

SOLID TIRES AT THE FRONT.

BASE depots, repair shops, anti-aircraft sections and workshops, and tire-press units are but a part of army transport service at the front; all are vital and must be kept going at all costs if supplies and munition replenishments are to be effectively distributed. This particularly applies when extensive battle operations are imminent and during the progress of the attack. In this connection it is well to call to mind the fact that motor transports saved the city of Verdun.

Of the most important sections are those for equipping vehicle



(C) British Official.

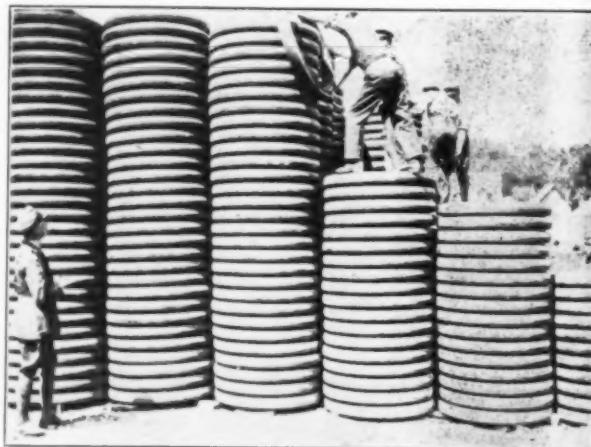
BRITISH MILITARY TIRE PRESS AT THE FRONT, APPLYING A SINGLE SOLID TIRE.

wheels with new tires. As there are vast numbers of commercial vehicles in active service, there are many units solely engaged on this work. The length of life of rubber tires under the arduous conditions of running experienced in the war areas is short. The roads—for such they are called for want of a better name—play havoc with tire surfaces; and constant renewal is necessary. To effect this, mobile tire-press units are employed.

The illustrations included herewith will give some idea of the stock of tires that is held, as well as the type of hydraulic press

utilized for removing worn tires and replacing them with new ones.

It may not be generally known that a British concern in making the tire presses used for the equipment of the motor transport



(C) British Official.
SOLID TIRES FOR BRITISH LORRIES IN FRANCE

branch of Uncle Sam's army. This particular press is like those used in the United States, but is stronger in various parts. The press is capable of giving 200 tons' pressure as against 150 tons in the standard press. The frame is made of stiffer material and the table is fitted with substantial guides, while a runway projecting from the center is fitted for lifting wheels and carrying them direct into the press itself, thus saving labor. ("The Commercial Motor," London.)

W. E. PALMER.

FROM a \$50 a month clerk to treasurer of the Goodyear Tire & Rubber Co., Akron, Ohio, a corporation whose sales for the past year exceeded the \$110,000,000 mark, is the record set by W. E. Palmer, whose election to treasurer of the company was announced at the last meeting of stockholders and directors. He succeeds F. H. Adams, who retired from the office after long service with the company but still remains a director.

Unlike many men who have left their native sections to seek their fortunes in distant cities, Mr. Palmer achieved his success in the county of his birth, for he was born at Hudson, Ohio, a few miles north of Akron.

He entered the Goodyear organization in 1898. Those were the days when President F. A. Seiberling could often be found in the factory, superintending its operations. Here Palmer found him bossing a gang of workmen setting up a cutting table, and asked him for a job. He was employed at a salary of \$50 a month, and his duties embraced keeping books, billing, time-keeping, etc.

Palmer worked himself step by step up the ladder of success. In the words of president Seiberling, when announcing his election at the stockholders' meeting, "Palmer has advanced from \$50-a-month clerkship to the position of treasurer by sheer merit—without a pull, other than that of hard work and real ability."

Mr. Palmer was recently notified of his election to receive the 33d degree of Scottish Rite Masonry, the highest honor that the Masonic fraternity can bestow.



W. E. PALMER.

War Service Committee of the Rubber Industry of the U. S. A.

RUBBER manufacturers, importers and dealers received the following notification, dated September 14, from the War Service Committee:

Mr. H. T. Dunn, chief of the rubber section of the War Industries Board, directed your War Service Committee to immediately prepare certain vital statistics in order to lay before him and the entire War Industries Board the present state of the rubber industry and its willingness to restrict non-essentials and so warrant a classification of the industry as a whole in such priorities as will secure necessary (a) labor, (b) fuel, and (c) transportation.

The Committee as requested went to Washington on September 11 and made the presentation. We enclose a printed copy of the statements and suggestions made to the War Industries Board.

As a result of this conference, your Committee is glad to report that the War Industries Board expressed a willingness to place on the preference list, the rubber industry on the following conditions:

A. That all manufacturers pledge themselves to agree to the restrictions and to abide by the instructions of the War Industries Board.

B. That all members of the industry follow the rules and requests of the Conservation Division of the War Industries Board.

C. That members of the industry execute a pledge and agree to exact one from their customers as to the sale and use of rubber products.

D. The pamphlet enclosed does not embody the final conclusions of that conference but with some modifications of the suggestions in the pamphlet, the War Industries Board and War Trade Board will immediately promulgate full information as to priorities, allocation of rubber, elimination or restrictions of productions and the form of pledge that will be required.

The statements and suggestions referred to in the above letter, follow:

INFORMATION AND SUGGESTIONS PRESENTED TO THE WAR INDUSTRIES BOARD BY THE WAR SERVICE COMMITTEE OF THE RUBBER INDUSTRY OF THE U. S. A.

The War Service Committee of the Rubber Industry has been informed by H. T. Dunn, chief of the rubber section of the War Industries Board, that it should as soon as possible make suggestions for the elimination of the manufacture of all articles containing rubber or reclaimed rubber which can be curtailed or dispensed with, if only temporarily, without interfering with the necessities of war and war work.

The Committee was informed that the object in asking for these suggestions was to enable the War Industries Board to place the industry on a basis which would insure priorities for the manufacture of articles which are deemed essential.

The Committee desires to point out that rubber products are mainly supplemental and not initiative to the industrial and commercial life of the country.

A curtailment of activities of the country will reflect a corresponding reduction in the demand for rubber goods so far as they are used for the purposes involved.

Rubber products which are complete in themselves and not component parts can be classified so far as being useful or non-useful, and the latter class is relatively so small that a curtailment or elimination would not be a serious matter to the continuation of the industry as a whole but in some cases might create a hardship upon individual concerns which specialize in the manufacture of some article or articles which would not come under the useful class.

For convenience of analysis and control the industry may be divided into the following classifications:

1. Pneumatic tires of all kinds.
 - (a) For automobiles.
 - (b) For motor cycles.
 - (c) For bicycles.

2. Solid tires.
3. Medical and surgical rubber goods.
4. Mechanical rubber goods.
5. Rubber footwear:
 - (a) Boots and shoes.
 - (b) Rubber and fiber heels and soles.
6. Insulated wire.
7. Rubber clothing.
8. Waterproof cloth.
9. Hard-rubber goods.
10. Gas defense products.
11. Aircraft materials.
12. Reclaimed rubber.
13. Miscellaneous not included in above.

The above classifications cover the entire industry and Exhibit A is appended which shows the relative importance of each branch in the consumption of rubber and reclaimed rubber; also the approximate percentage of cost of labor and power to the total cost of each group.

The Committee is informed that the Government's method of cooperating with the rubber industry will now take the form of granting priorities for rubber, other materials, labor and fuel only for useful purposes.

The Committee desires to endorse heartily this method of control and to express the belief that it can be of material help to the War Industries Board in establishing a proper balance between too much or too little restriction.

CONTROL OF INDUSTRY.

It would be impossible to enumerate the various articles produced by the industry and it seems to the Committee that the only practical method of control is to determine first the status of as many branches and individual articles as possible, and for everything else to define the *uses* for which rubber articles may be produced.

This would immediately stop production of all goods which are not upon the approved list or are not necessary for the uses which have been approved.

This ruling would form a drag-net into which would fall thousands of articles which would require classification into useful or non-useful, or, in other words, articles which will or will not be allowed to be produced in whole or in part.

The following uses are suggested for which rubber goods are a necessity and the production of which should be allowed to the extent that the various activities are allowed to operate:

1. All rubber products necessary for filling government orders.
2. Red Cross requirements.
3. Athletic goods.
4. Rubber supplies for all activities permitted whether required for finished products or for the operation of the activity.

EXAMPLES.

Railway supplies.	Coke plants.
Ship yard and ship building supplies.	Cement plants.
Supplies for factories.	Foundries.
Supplies for agriculture.	Cotton and woolen mills.
Supplies for food and feed.	Paper mills.
Mining supplies.	Tanneries.
Supplies for oil wells and refineries.	Manufacturers of leather boots and shoes.
Fire hose.	Supplies for telegraph, telephone and express companies.
Lumber production.	Supplies for electrical industry.
Automobile manufacturers' supplies.	

(See Exhibit B.)

A few rubber articles may be used by such a classification of industrial activities which might be dispensed with and a careful analysis must be made.

The following divisions of the industry would come under the above control of allowing rubber articles to be produced only for approved uses: mechanical rubber goods, hard-rubber goods (see Exhibit C), and miscellaneous not included in any other division.

The remaining divisions would be:

GAS DEFENSE.
The Government only.

AIRCRAFT.

The Government Only.

INSULATED WIRE.

This division committee of the War Service Committee of the Rubber Industry is practically the same as the Wire and Cable Committee of the Electrical Manufacturing Industry. It is suggested that the Wire and Cable Committee is better qualified to handle this branch of the rubber industry for the War Industries Board. Rubber manufacturers making insulated wire would then come under whatever regulations were determined upon, if any.

ATHLETIC GOODS.

The Committee suggests that no curtailment be placed upon the production of these goods. They form an unimportant part of the industry, but contribute largely to national health and physique.

SOLID TIRES.

Viewed broadly this branch of the industry is practically 100 per cent essential, and at present the Government requirements are taxing the production facilities to such an extent that stocks are automatically being reduced.

RUBBER FOOTWEAR.

(a) Boots and Shoes.—There are twelve manufacturers in this division and all are working on government orders to such an extent that civilian requirements cannot be supplied. Next winter will probably see a shortage of rubber footwear for civilian use; so in this division there is even greater curtailment than may be desirable.

(b) Rubber and Fiber Heels and Soles.—These goods are made from rubber and fiber compounds and replace leather. They will outwear leather at least two to one. Many millions of people are dependent upon them.

(See Exhibit D.)

EXPORT.

This is not included in the list of divisions of the industry, but the Committee understands that it is the desire of the Government to conserve and promote, wherever consistent, foreign trade—first, in order to maintain the foothold in foreign markets secured at considerable expense; second, to correct unfavorable exchange rates and to liquidate, by means of trade, unfavorable balances; and, third, to bring in gold.

If the understanding of the Committee is correct, it would appear desirable to continue uninterruptedly the export of rubber products subject to the control of the War Trade Board. A ruling is therefore requested with reference to export business.

RECLAIMED RUBBER.

This branch of the industry is entirely dependent upon rubber manufacturers for its existence. It is composed of several independent units and reclaiming departments of rubber manufacturers.

Any curtailment in production of rubber goods will automatically curtail production of reclaimed rubber.

The Committee desires to point out that the use of reclaimed rubber in the manufacture of rubber goods is one of the most important items of technique in the industry. Economy and competition are sufficient incentives for its use, and any further attempt to force its consumption would result in unsound practice.

RUBBER CLOTHING.

A large percentage of the production of rubber clothing is taken over for the needs of the Government, and plans for standardization of what is made for civilian use are now under way. Waterproof clothing, being used as a protection from the elements, comes under relatively the same class as rubber footwear, although the demand is not so great, nor are the stocks in the country so small.

MEDICAL RUBBER Goods.

The principal articles produced under this classification in volume of production are hot-water bottles, fountain syringes,

and surgeons' gloves. The production of surgeons' gloves at the present time is very largely for the use of the Medical Departments of the Army and Navy.

There are numerous other articles under this general classification, all of which are essential for the sick-room or necessary to the health and well-being of the people, but in no one item is the production of unusual volume. The production of water bottles and syringes has been along rather extravagant lines, owing to the large variety of styles and types manufactured, but this number has been greatly reduced, as per report filed with the Conservation Division.

WATERPROOF CLOTH.

Aside from hospital sheeting, which is used in all hospitals and in many homes, the greater part of the production of waterproof cloth goes into the various lines of industry, where it is cut up and used in manufacturing articles of common use. Several examples are as follows:

Tobacco Trade.—Waterproof sheeting is used for covering, sweating, curing and handling tobacco, and is also used in making aprons for the production of machine-manufactured cigars and cigarettes.

Piano and Organ Trade.—Various qualities of waterproof and air-tight cloth are manufactured for small and large bellows of player-pianos, as well as for organs.

Cameras.—Light-proof rubber-coated cloth is used for extension bellows in cameras, also for focusing purposes.

Automobile Tops.—Automobile-top material is manufactured in large quantities for the production of new tops for automobiles, and in small quantities for repairs and replacements of old tops.

Hat Trade.—A limited quantity of rubber-coated material is used by hatters for the forming of straw and felt hats.

Engraving and Printing.—Rubber-coated cloth is used in printing establishments wherever fine engraved printing is done, such as bank notes and stock certificates, and a considerable quantity is used by the government printing works.

Cutting Trade.—A limited quantity of light-weight, waterproof material is used for the manufacture of small articles, such as nursery sheets, diapers, dress-shields, acid sleeves, money-belts, etc. It is also used for the manufacture of children's bath tubs.

Proofers.—A large quantity of cloth is waterproofed for the use of manufacturers of mackintosh clothing who have no rubber mills.

PNEUMATIC TIRES.

This branch is the most important in the industry. It is suggested that, for the purpose of allocation and priorities, casings and tubes be considered as one article. Demand will automatically regulate a balanced production, as one is useless without the other.

The War Service Committee understands that it is desired to curtail pneumatic tire production to the lowest point which will still preserve the structure of the industry. In this connection it is to be noted that the production of tires in the present volume is of recent origin and is represented by many units varying from large to medium and small. Roughly classified it may be stated that there are five large tire manufacturers, seven medium-sized tire manufacturers, and about 100 small tire manufacturers.

The daily production based on 265 working days for 1917 was, for so-called large, from 9,800 to 21,600 tires per day; for the so-called medium, from 1,300 to 3,600 per day; for the so-called small, from 10 to 1,000 per day.

Many of the so-called small manufacturers are not yet well-established and are dependent upon maximum capacity to meet obligations. Any drastic curtailment will threaten the existence of some of these so-called small units and this is accentuated by the possibility that they will be unable to compete for government business. It is therefore apparent that it would not be ethical for the War Service Committee to recommend a minimum point of production which would still preserve the structure of the industry, inasmuch as this would actually provide for the ruin of some of the units, and the Committee does not feel it should be asked to take this responsibility.

Now that a rubber section of the War Industries Board has been established, the Committee feels it should no longer be asked to make recommendations, but should confine its work to procuring and presenting information asked for, as well as keeping the Board fully posted on current conditions of the industry.

The War Industries Board is now in a more favorable position than the Committee to form an intelligent opinion regarding the

amount and regulation of future allocations in respect to the manufacture of pneumatic tires.

The committee presents the following information to guide the Board in determining the necessary production to provide for present and future needs to conform with the general policy controlling the use of automobiles.

BASIS—50 PER CENT OF 1917 PRODUCTION.

	Total number produced.	Number per day, (365 days per year)
Production, 1917	25,300,000	69,315
50 per cent curtailment	12,650,000	34,657
Present consumption, estimated	24,500,000	67,123
Net loss per day		32,466
Manufacturers' stocks on hand July 31, 1918		4,500,000
Dealers' stocks on hand July 31, 1918, estimated		3,000,000

Total stocks on hand July 31, 1918, estimated..... 7,500,000

At the above rate of production and consumption, stocks will theoretically last 231 days, making complete exhaustion the latter part of March, 1919.

A shortage throughout the country will be felt during the middle of November, 1918.

Unbalanced stocks require a considerable anticipation of above dates.

BASIS—50 PER CENT OF 18 MONTHS' PRODUCTION.

(JANUARY 1, 1917, TO JUNE 30, 1918.)

	Total number produced.	Number per day, (365 days per year)
18 months' production	37,050,000	67,671
50 per cent curtailment	18,525,000	33,835
Present consumption, estimated	24,500,000	67,123
Net loss per day		33,288
Manufacturers' stocks on hand June 30, 1918		4,500,000
Dealers' stocks on hand June 30, 1918, estimated		3,000,000

Total stocks on hand June 30, 1918, estimated..... 7,500,000

At the above rate of production and consumption stocks will theoretically last 225 days, making complete exhaustion the middle of March, 1919.

A shortage throughout the country will be felt during the first part of November.

It is pointed out that, long before the point of exhaustion is reached, there will be a shortage throughout the country. Due to the various sizes and styles with which cars are equipped and the necessity of carrying these at available points in order to give prompt delivery and thus prevent owners from hoarding private stocks, it is estimated that when total stocks of manufacturers and dealers reach a minimum of 4,000,000 tires a shortage will be felt. This figure includes tires in transit which would total at least 750,000 to supply the country's present requirements.

The stock requirements would, of course, become less in relation to the restricted use of automobiles.

EXHIBIT A.

Article	Pounds of Rubber consumed in 1917.	Pounds Reclaimed Rubber consumed in 1917.	Percent- age of Labor Cost.	Percent- age of Power Cost.
Automobile pneumatic casings	170,991,631	33,208,873		
Automobile pneumatic tubes	37,547,640	855,669	15	2
Motor and bicycle tires and tire sundries	6,305,449	6,199,427		
Soft tires	26,176,513	6,789,200	7	2
Total tires and tubes	241,021,233	47,053,169		
Mechanical rubber goods	31,743,880	71,568,850		
Boots and shoes	28,726,118	35,808,401		
Insulated wire and insulating compounds	6,011,388	19,052,071		
Druggists' and stationers' sundries and surgical rubber goods	8,359,937	394,004		
Waterproof clothing, including carriage cloth and rubber sheeting	3,562,833	11,694,326		
Waterproof cloth, including single and double texture	1,310,694	999,289		
Hard rubber goods	2,610,544	4,845,968		
Rubber cement	3,275,676	18,663		
Miscellaneous, not included in any of the above schedules	4,031,341	4,533,447		
Grand total	330,653,644	195,968,188		

EXHIBIT B.

MECHANICAL RUBBER GOODS.

This branch of the industry is very important and includes many thousands of articles of great diversity. They may be generally subdivided into the following classifications:

1. Belting.
2. Rubber hose.
3. Packing.
4. Cotton rubber-lined hose.
5. Mats, matting, and tiling.
6. Molded goods.
7. Heels and soles.
8. Friction tape.
9. Jar rings.
10. Rubber thread.
11. Tubing.
12. Lathe and hand-made goods.
13. Springs and bumpers.
14. Miscellaneous.

The following is a partial list of articles used for essential purposes:

SUPPLIES FOR FACTORIES, MACHINERY AND MATERIALS NEEDED IN PRODUCTION AUTHORIZED BY THE GOVERNMENT.

Rubber thread for elastic web manufacturers and airplane shock absorber cord; blankets for printing presses; all kinds of packings, hose, belt, moulded goods and rubber-covered rolls for coke plants, cement plants, stone quarries, powder plants, steel mills, nitrate plants, foundries, cotton and woolen plants, tanneries, paper mills, and all classes of essential factories.

SUPPLIES FOR AGRICULTURE.

Thresher belts,	Packings,
Suction hose,	Steam hose.
Water hose,	

SUPPLIES FOR FOOD AND FEED.

Grain elevators, mills, packing houses, etc., and also supplies for canning and preserving.

Elevator belts,	Hog-scrapers belts,
Conveyor belts,	Molded goods,
Hose,	Valves,
Packings,	Hot-water tubing,
Jar rings,	Large number of special molded articles for sugar plants.
Squiggle rubber,	
Transmission belts,	

RAILWAY SUPPLIES.

Air-brake hose,	Throttle packing,
Car-heating hose,	Air-pump packing,
Engine and tender hose,	Piston and pump packing,
Fire hose,	Sheet packings,
Air and pneumatic tool hose,	Valves,
Steam hose,	Squirt hose,
Water hose,	Step treads,
Axle dynamo belting,	Tiling.
Air-brake gaskets,	

SHIPS, SHIPYARDS AND SHIP BUILDING SUPPLIES.

Packings,	Suction hose,
Deck hose,	Oil hose (for oil burning boats),
Air and pneumatic tool hose,	Fire hose.
Steam hose,	

MINING SUPPLIES.

Elevator belts,	Vanner belts,
Conveyor belts,	Packings,
Transmission belts,	Valves,
Air hose,	Molded goods,
Steam hose,	Fire hose.
Water hose,	

SUPPLIES FOR OIL WELLS AND REFINERS.

Driller belts,	Packer rubbers,
Transmission belts,	Swab rubbers,
Oil hose,	Caps,
Water hose,	Pipe rings,
Suction and discharge hose,	Packings,
Steam hose,	Fire hose.
Stuffing-box rings,	

LUMBER.

Belts,	Packings.
Hose,	

AUTO MANUFACTURERS' SUPPLIES.

Radiator hose,	Brake lining.
Molded goods,	

LEATHER BOOT AND SHOE MANUFACTURERS.

Belting,	Hose,
Cements,	Packings.
Coated fabrics,	

ELECTRICAL INDUSTRY.

Tape,	Hard-rubber goods,
Matting,	Beltng hose and packings.

SUPPLIES TO TELEGRAPH, TELEPHONE AND EXPRESS COMPANIES.

Tape,	Hard-rubber goods.
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EXHIBIT C.

HARD RUBBER.

This division of the industry is separate and distinct from the others, inasmuch as its products represent an entirely different finished material.

The important items are:

1. Battery jars, including submarine jars and battery-jar accessories.
2. Sheet rod and tube for electrical purposes.
3. Hard-rubber combs.
4. Hard-rubber accessories for medical and surgical goods.
5. Pipe bits.
6. Fountain-pen parts.
7. Automobile accessories.
8. Buttons.
9. Pipes for conducting chemicals.
10. Receptacles for powder mills.
11. Buckets for handling acids in chemical plants and powder mills.

In addition to these there are thousands of miscellaneous articles made from hard rubber which cannot be classified.

Production of the following hard-rubber articles has already been discontinued by the principal manufacturers:

Buttons (other than Navy buttons),	Crochet hooks,
Hairpins,	Funnels,
Pen holders,	Caustic holders,
Brush backs,	Pocket flasks,
Bowling balls,	Tumblers,
Roule balls,	Cork-screw handles,
Duck pin balls,	Beer-glass stands,
Cigar and cigarette holders,	Beer scrapers,
Rulers, inkstands,	Beer shakers,
Stethoscopes,	Drug scoops,
Ear trumpets,	Suppositories,
Teething rings,	Thimbles,
Match boxes,	Tatting shuttles,
Letter openers,	Embroidery rings,

EXHIBIT D.

RUBBER HEELS AND FIBER SOLES.

Uses.—Rubber heels and fiber soles are used in large quantities both in the construction of new shoes and in the repair of old ones.

In the past year approximately 75,000,000 pairs of rubber heels and 15,000,000 pairs of fiber soles were made and used in the United States alone.

Both are used as a substitute for leather and both give longer service than leather soles and heels, respectively.

Rubber heels and fiber soles are used largely by working people who stand upon their feet or walk while at work.

Economies.—Shoes either made or repaired with rubber heels and fiber soles are cheaper to the consumer than with the corresponding leather parts.

Fiber soles have enabled the manufacturer of shoes to market a serviceable product at a price within the reach of the laboring classes.

Fiber soles and rubber heels will wear from two to three times as long as corresponding parts made from leather employed for similar purposes.

Consequently there is great economy both in labor and in materials in the making and use of rubber heels and fiber soles, for where heels and soles of leather are used they must be removed and the shoes repaired two or three times as often as where the rubber heels and fiber soles are used.

Moreover, there is an initial saving in labor, since it requires less labor to produce rubber heels and fiber soles than to produce heels and soles of leather.

About fifty per cent of the labor used at present in the producing of rubber heels and fiber soles is female labor.

There is a saving in steel (approximately 50 per cent) in the use of the rubber heel. First, because it requires fewer nails to attach the rubber heel and, second, because a set of nails employed to attach a rubber heel is used through the lives of two or three sets of nails employed in attaching any other type of heel.

Rubber heels and fiber soles are made largely from by-products, including reclaimed rubber, which by-products do not occupy ship space. There is an adequate supply of such by-products available which is not needed in the production of more essential articles.

If the production of rubber heels and fiber soles was curtailed, leather would be substituted therefor and additional leather for this purpose must be imported and, therefore, occupy much ship space.

Fiber soles and rubber heels are waterproof and eliminate the necessity of using rubber shoes on many occasions.

Precedent.—Great Britain has found it advisable to encourage the making and use of rubber heels and fiber soles during the war.

THE RUBBER INDUSTRY AN ESSENTIAL INDUSTRY OF CLASS C-4.

THE following letter of September 23 was addressed to the rubber industry by the War Service Committee:

The War Service Committee of the Rubber Industry of the United States presented a brief on Wednesday, September 11, 1918, to the Priorities Division of the War Industries Board with the object of having the industry placed upon the preference list.

The Priorities Division has expressed its confidence in the good faith of the rubber industry and subject to its agreement to fulfill all requirements of the War Industries Board and the War Trade Board has designated it an essential industry with a classification of Class C-4.

A bulletin, issued by the War Industries Board, designating the classification of the rubber industry and a pledge to be signed by each manufacturer is printed below. No manufacturer will be entitled to priorities on the preference list until he has signed the pledge.

WAR INDUSTRIES BOARD PRIORITIES DIVISION.

CIRCULAR No. 24.

To All Rubber Manufacturers:

The Priorities Division of the War Industries Board, after conference between your representatives and the undersigned with other representatives of said board, has considered the status of your industry and its claims for general preferential treatment and for priorities in obtaining its supply of materials, and has reached the following conclusions:

A large part of the production of your industry is essential either for direct or indirect government uses or to supply necessary industrial and civilian requirements. There is, however, an element of non-essentiality in that production which in the national interest and to conserve the nation's supply of fuel, transportation, labor and material should be eliminated. The representatives of your industry have signified to the Priorities Division the willingness of the industry as a whole to strip itself of this non-essential production, and in its remaining production to limit itself to supplying only the current demand and to adopt all practical measures which will tend to conserve supplies of raw material, labor, fuel and transportation.

The Priorities Division believes that if the production program herein-after outlined is adopted and faithfully observed, the industry as a whole may be said to be engaged in essential production under conditions entitling it to preferential treatment in obtaining its supply of fuel, labor and transportation, and to proper priority assistance in obtaining its supplies of material.

1. Each manufacturer shall conserve to the greatest possible extent raw materials, fuel and labor; shall eliminate from its production unnecessary or undesirable types, sizes and styles of articles; and particularly shall observe and comply with any conservation plan promulgated or approved by the Conservation Division of the War Industries Board.

2. Each manufacturer shall limit its production of each and every article and item of production as near as may be to the current demand therefor; shall carry stocks only in amounts reasonably necessary to insure the supplying of current demands, and shall refrain from hoarding fuel, raw material or finished or semi-finished products.

3. Each manufacturer shall limit its items and amounts of production for export to those covered by export licenses issued by the War Trade Board.

PRODUCTION PROGRAM.

4. Each manufacturer shall, as soon as possible after completing the manufacture of such articles already in process, wholly eliminate from its production all articles for which there is no essential use; and particularly all articles designated or listed as of such character by the War Industries Board.

5. No manufacturer shall produce or deliver any article except for such essential uses as may be designated from time to time by the Priorities Division of the War Industries Board, and for the present to include the following general uses:

(a) For filling government orders and orders of the American Red Cross.

(b) For furnishing supplies to railroads operated by the United States Railroad Administration.

(c) For furnishing necessary supplies to preferred industries and plants, as the same are included from time to time upon the preference list of said Priorities Division.

(d) For furnishing necessary supplies to those industries not listed upon said preference list, but found by the said Priorities Division to be more or less essential and allowed to operate under a curtailed or controlled production program; but only to the extent that such supplies are necessary to enable any such plant to produce in accordance with such program.

(e) For civilian clothing and footwear (boots and shoes, rubber and fiber heels and soles), to the extent of the present production and to supply current demands only; the manufacturer to encourage conservation and economy by the public.

(f) For medicinal and sanitary purposes; to the extent of the current demand, and subject to strict compliance with any conservation program announced or approved by the Conservation Division of the War Industries Board.

6. Using as a basis the production of automobile casings and tubes under six inches for the eighteen months ended June 30, 1918 (not including those invoiced on direct government orders during the same period), the maximum production of such articles by each manufacturer for the last three months of 1918 is fixed at 3/12 of 50 per cent (measured both

by number of units and amount of rubber consumed) of the average annual production for said eighteen months' period; provided, however, that such maximum production may be increased to the extent of such casings and tubes produced on direct orders from any agency of the United States Government; and provided further, that in the case of tire manufacturers whose plants were not in operation previous to January 1, 1917, but were in operation previous to January 1, 1918, such maximum production of each such manufacturer for the last three months of 1918 shall be one-half of 50 per cent of its production during the period January 1, 1918-June 30, 1918.

7. No restriction will at the present be placed upon the production of solid tires, or of pneumatic tires other than those described in the paragraph next hereinabove, except that such production shall not exceed that required to fill the current demand therefor.

8. Each manufacturer shall comply with all further or other orders of the War Industries Board with respect to the character and extent of its production and operations.

9. Each manufacturer shall file with the Priorities Division of the War Industries Board a pledge in writing in the form following:

MANUFACTURER'S PLEDGE.

Priorities Division, War Industries Board,
Washington, D. C.

The undersigned hereby pledges itself (1) not to use nor so far as lies within its power permit to be used any products of its manufacture now in or which may hereafter come into its possession or control save (a) for essential uses as that term has been or may be defined or applied from time to time by the Priorities Division of the War Industries Board, or (b) under permits in writing signed by or under authority of such Priorities Division; (2) that it will make no sale or delivery of any such products to any customer for resale until such customer has filed with it a similar pledge in writing and that it will use its utmost endeavor to insure that its products shall be distributed solely for essential uses; provided that the provisions of this subdivision of this pledge shall not, until further order of the War Industries Board, apply to casings and tubes under six inches; (3) that it will in all things strictly observe and comply with the production program for rubber manufacturers as the same is set out in Circular No. 24 issued by said Priorities Division under date of September 21, 1918, and will limit and curtail its production, eliminate the production of non-essential articles, and adopt conservation measures and programs as provided in such circular; (4) that it will observe and comply with all other or further rulings and orders of the said Priorities Division; (5) that it will make and render at such time or times as may be designated any report or reports concerning its production and activities as may be required by said Priorities Division or the Rubber Section of the War Industries Board.

10. No manufacturer shall make, sell or deliver any of its products to any customer for resale until such customer has filed with it a pledge in writing in the following form:

CUSTOMER'S PLEDGE.

To—

The undersigned hereby pledges itself not to use, nor so far as lies within its power permit to be used, any products of your manufacture now in or which may hereafter come into its possession or control save (a) for essential uses as that term has been or may be defined or applied from time to time by the Priorities Division of the War Industries Board, or (b) under permits in writing signed by or under authority of such Priorities Division, provided that the provisions of this pledge shall not, until further order of the War Industries Board, apply to casings and tubes under six inches; further that it will make no sale or delivery of such product to any customer for resale until such customer has filed with the undersigned a pledge similar to this.

The Priorities Division, believing that compliance with the above program will eliminate from the production of rubber manufacturers substantially all non-essential production, and accepting the assurances of the representatives of the industry that such program will be immediately put into effect, has certified the industry as a preferred industry, giving it a rating as Class IV. This action will entitle the industry to preferential treatment in its supply of fuel, labor and transportation in the manner and to the extent explained in the "Foreword" to Preference List No. 2 issued by said Priorities Division as Circular No. 20 under date of September 3, 1918.

If, however, any rubber manufacturer shall (a) fail to file within fifteen days from the date of this circular its written pledge as hereinabove provided, or (b) fail to observe and comply with any of the terms or conditions of its written pledge, said manufacturer will forfeit its right to preferential treatment under the general listing of the industry as a whole, and will be certified to the various government agencies controlling the supply of labor, fuel and transportation as having so forfeited its right to preferential treatment.

By virtue of the placing of the industry on the preference list rubber manufacturers will be entitled, in obtaining their supply of raw materials or finished or semi-finished products, to an automatic Class C rating under the terms and provisions of Circular No. 4 of the Priorities Division of the War Industries Board, dated July 1, 1918. If for any reason the manufacturer is unable to obtain materials under such automatic Class C rating, he may apply to the Priorities Committee for a higher rating by priority certificate, and said application will be given proper consideration.

The Priorities Division relies upon the rubber industry and each and all of the plants constituting the same to faithfully and conscientiously observe and comply with all of the terms of the program herein set out, and to cooperate whole-heartedly with the government in its effort to conserve and most effectively use the nation's supply of material, labor, fuel and transportation, to the end that the full strength of the nation may be mobilized in the most effective manner and directed into the most effective channels for the accomplishment of the one great common purpose—the winning of the war.

Yours very truly,

EDWIN B. PARKER,
Priorities Commissioner.

Washington, D. C., September 21, 1918.

R. K. P. QUESTIONNAIRE NO. 19-M.

This questionnaire was sent to manufacturers September 23, at the request of the War Trade Board for information as to the stocks of crude rubber, including jelutong (poutianak), gutta percha, balata and gutta siak, on hand and in transit, as of September 30, 1918; the answered questionnaire to be returned immediately to Irving B. Ferguson, C. P. A., 511 Fifth avenue, New York City.

W. S. C. QUESTIONNAIRE NO. 18.

At the request of the War Industries Board, this questionnaire was sent to manufacturers September 23, for information respecting the quantity of crude rubber, dry weight (not including balata, guayule, gutta percha, gutta siak and jelutong); used in the production of specified classes of goods during July, August and September, 1918; the answered questionnaire to be returned by October 10 to Irving B. Ferguson, C. P. A., 511 Fifth avenue, New York City.

Crude Rubber Allocation for the Next Quarter.

ON September 23, manufacturers and importers were informed by the Committee on Rubber and Kindred Products that the War Trade Board had adopted the following allocation program for October, November and December:

The quantity of rubber for which import licenses may be issued by the War Trade Board during the forthcoming October-December period has been fixed at 25,000 tons, and will be allocated in accordance with the following program to manufacturers who have furnished the information called for in Questionnaires 2, 14, 16 and 17, and who conformed to the plan of curtailment of production during the months of August and September announced by the War Trade Board, and who subscribed to the limitations and regulations governing the production and sale of rubber products as promulgated, or as may be hereafter promulgated, by the War Industries Board.

For the purpose of allocation, the consumption of crude rubber will be considered under three classes, as follows:

CLASS A. That used in the manufacture of products invoiced during October-December, 1918, on direct government orders. (Direct government orders are to include direct orders from all railroad, express, telephone and telegraph companies under Government control, direct Red Cross and direct Allied Government orders.)

CLASS B. That used in the manufacture of automobile casings and tubes under six inches in diameter.

CLASS C. That used in the manufacture of all other rubber products.

Rubber will be allocated in the three classes upon the following basis:

CLASS A. Rubber consumed in this class will be replaced in full, if reported in the usual manner. Manufacturers will have the privilege of making advance applications for an amount not to exceed 75 per cent of the amount to which they will be entitled. The remainder is to be replaced when the exact amount has been determined.

CLASS B. (1) To manufacturers whose plants were in operation previous to January 1, 1917, on the basis of 1/18 of their 18 months' rubber consumption in said class from January, 1917, to June, 1918, inclusive, after deducting from said consumption all rubber consumed in direct government orders falling within said class, invoiced January-June, 1918, inclusive.

(2) To manufacturers whose plants were not in operation previous to January 1, 1917, but were previous to January 1, 1918, on the basis of 1/6 of their rubber consumption in said class from January, 1918, to June, 1918, inclusive, after deducting from said consumption all rubber consumed in direct government orders falling within said class, invoiced during January-June, 1918, inclusive.

(3) To manufacturers whose plants were not in operation previous to January 1, 1918, but were previous to July 1, 1918, a quantity equal to their average monthly rubber consumption in said class during the period of operation to August 1, 1918, after deducting rubber consumed in direct government orders falling within the said class, invoiced during said period.

CLASS C. Manufacturers will be allocated a quantity equal to $\frac{3}{4}$ of their consumption of rubber in said class during April, May and June, 1918, after deducting rubber consumed in direct government orders falling within said class, invoiced during April, May and June, inclusive.

The amount allocated to each manufacturer will be entered in the books of the Bureau of Imports of the War Trade Board, which amount can be checked against by the manufacturers in the form of allocation certificates, which will be furnished by the Bureau of Imports.

These allocation certificates will be issued to each manufacturer in two forms. Twenty-five per cent of the allocation will be limited to rubber from Central and South America. Seventy-five per cent of the allocation will be for rubber from any source. Manufacturers must utilize the full amount of their allocation before any allocation will be made them in succeeding periods.

FEATURES OF THE NEW PLAN.

The Committee on Rubber and Kindred Products states that this plan of allocation differs from the preceding ones in certain respects, amongst them as follows:

(1) Variable percentages are allotted against the three classes of A, B and C and the basis of allocation is predicated on different periods in lieu of 1917 consumption as heretofore employed.

(2) Rubber used in filling indirect government orders will not be replaced. We are informed that so much difficulty has been experienced in tracing same to a government order that the plan is not workable. We are also advised that nearly all government orders for rubber goods consuming substantial quantities of rubber will be placed direct by the Government from now on, and this along with the increased allocation in Class C, which class represents the characters of goods largely used in indirect business, should simplify this problem.

(3) All figures of consumption upon which the allocation is predicated will be the amount of rubber used in other than government business. Rubber used in direct government orders heretofore has been fully replaced as it will be during the forthcoming period.

To such manufacturers who were not in receipt of an allocation covering the August-September period, we are informed by the War Trade Board that if they are entitled to one for the forthcoming quarter that they will receive in addition thereto a proportionately greater amount to cover the aforesaid two months.

RULES GOVERNING PRODUCTION AND SALE OF RUBBER PRODUCTS.

The War Service Committee notified all manufacturers on September 23 as follows:

We are instructed by the War Industries Board to advise that the following limitations and regulations governing production and sale of rubber products will be in effect for the period of October-November-December, 1918:

1. Manufacturers may produce during the period all classes of rubber products (except automobile casings and tubes under six inches) considered essential and for essential use, in accordance with rules and regulations that may be issued from time to time by order of the Priorities and Conservation Divisions of the War Industries Board, in quantity measured by rubber consumed equal to but not in excess of 100 per cent of their April-May-June (1918) rubber consumption in all products (except automobile casings and tubes under six inches) not including in said consumption rubber consumed in all products invoiced during said period on direct Government orders.

This limitation of 100 per cent in production does not apply to government business or essential medical or surgical goods which may be produced to meet requirements.

2. Tire manufacturers whose plants were in operation previous to January 1, 1917, may produce during the period, exclusive of direct government orders, up to but not in excess of 1/12 of the automobile casings and tubes under six inches manufactured by them during the period from January, 1917, to June, 1918, inclusive (not including in said production automobile casings and tubes under six inches invoiced on direct government orders during the period January, 1918, to June, 1918), measured by rubber consumed and by number produced.

3. Tire manufacturers whose plants were not in operation previous to January 1, 1917, but were in operation previous to January 1, 1918, may produce during the period, exclusive of direct government orders, up to but not in excess of 1/4 of the automobile casings and tubes under six inches manufactured by them during the period January to June, 1918 (not including in said production automobile casings and tubes under six inches invoiced

on direct government orders during the period January to June, 1918), measured by rubber consumed and by number produced.

4. Tire manufacturers whose plants were not in operation previous to January 1, 1918, but were in operation previous to July 1, 1918, may produce each month during the period, exclusive of direct government orders, a quantity equal to but not in excess of 50 per cent of their average monthly production of automobile casings and tubes under six inches manufactured by them for the period of operation to August 1, 1918, measured by rubber consumed and by number produced.

5. Manufacturers producing more than one class of rubber products will be privileged to increase their consumption of rubber in any of the several classes of products listed as essential (except automobile casings and tubes under six inches) provided they make a corresponding decrease in the consumption of rubber in other classes so that their total consumption shall not be greater than herein provided for.

6. Manufacturers having raw materials on hand, and who are unable to operate their plants on basis of restricted output herein or hereafter provided will be allowed a greater production to avoid so far as possible manufacturing loss in the liquidation of their inventories. All such cases should be reported direct to the Rubber Section of the War Industries Board, accompanied by a sworn statement of the quantity of rubber (specifying green or dry weight), of fabric in pounds (specifying types), and of other principal materials on hand. Tire manufacturers should state the minimum schedule of casings and tubes on which their plants can be operated without manufacturing loss.

AN IMPORTANT LETTER TO TIRE DEALERS.

The War Service Committee, in the following letter dated September 23, requests the hearty cooperation of all tire dealers:

This committee has frequently had brought to its attention newspaper and trade paper reports and other rumors, erroneous either in whole or in part, as to the attitude of the Federal Government as expressed by the War Industries Board in connection with the manufacture, distribution and purchase by users of pneumatic automobile tires.

In connection with the National War Program, the Government desires to help and induce all to save unnecessary investments in materials, unnecessary expenditures of money, and unnecessary employment of man power.

In connection with our National Shipping Program, they also desire to save shipping space.

Such limitations as have been made in the importation of supplies of crude rubber have been made after a full conference with the Industry, and it is the intention of the War Industries Board to endeavor to see that the country has all that it *actually needs* without any undue hardship. Any restriction in the production of pneumatic tires is made after a review of the conditions of stocks in the hands of manufacturers throughout the country, for the purpose of reducing unnecessary investments in tires, and you are urged to aid in this national program and to prevent, so far as lies in your power, any hoarding of tires, or any unnecessary purchase or anticipation of needs on the part of distributors, dealers or owners.

We are confident that a sufficient quantity of tires will be manufactured to take care of the cars that will be permitted to be run, and the Government will look with stern disfavor on any profiteering or hoarding and will act accordingly.

Your patriotic and hearty cooperation is solicited.

AMERICAN SOLDIERS THANKFUL FOR CONTRIBUTIONS TO SMOKE FUND.

Twenty postal cards have been received from American soldiers over there, expressing their appreciation of the tobacco obtained through the contributions of the Rubber Association of America, Inc., to the Smoke Fund.

SALES OF CIVILIAN RUBBER CLOTHING TO BE MINIMIZED.

In view of the constantly increasing demands for war goods, the United States Rubber Co. has requested its branch managers to keep sales of rubber clothing for civilian purposes at the minimum.

RUBBER AND BALATA EXPORTS FROM PANAMA.

During 1917, the exports of balata from Panama amounted to 563,198 kilos, value \$513,263, while the quantity of rubber shipped totaled 51,579 kilos, value \$60,576.

THE ECONOMIC VALUES OF CRUDE RUBBER IMPORTS.

ACCORDING to information obtained by the Committee on Rubber and Kindred Products, crude rubber has advantages in gross import values, cubical storage, dollar values and dead weights, as compared with other import commodities.

The total tonnage of crude rubber shipped by the Pacific route is shown in the following tabulation:

From:		CALENDAR YEAR.		JANUARY.
		1917.	1918.	
British East Indies	pounds	195,325,015	15,299,675	
Dutch East Indies		59,689,895	6,316,601	
Totals	pounds	255,014,910	21,616,276	
Totals	long tons	113,846	9,650	

The value of these imports in United States dollars is shown below:

From:		CALENDAR YEAR.		JANUARY.
		1917.	1918.	
British East Indies		\$113,480,370	\$8,216,439	
Dutch East Indies		36,671,226	3,397,655	
Totals		\$150,151,596	\$11,614,094	

The relative percentage of rubber tonnage on the Pacific to the total tonnage is obtained by the following calculations:

Crude rubber, on the average, will store about 30 pounds to the cubic foot. Reducing the tonnage of rubber imports at Pacific ports to units of 100 cubic feet by dividing the total pounds by 3,000, the following cargo space units are obtained:

	CALENDAR YEAR.		JANUARY.
	1917.	1918.	
Rubber cargo tons	85,005	7,205	
Total Pacific tonnage	2,333,140	256,948	
Per cent of rubber tonnage to total tonnage	3.6	2.8	

The values in United States dollars of Pacific Coast imports follow:

	CALENDAR YEAR.		JANUARY.
	1917.	1918.	
Total imports	\$539,335,640	\$51,663,273	
Rubber imports	150,151,590	11,614,094	
Per cent of rubber imports to total imports	28	22.5	

Therefore, in 1917 rubber occupied only 3.6 per cent of the total tonnage, but represented in value 28 per cent of the total imports on the Pacific coast. For the month of January, 1918, the corresponding percentages were 2.8 and 22.5.

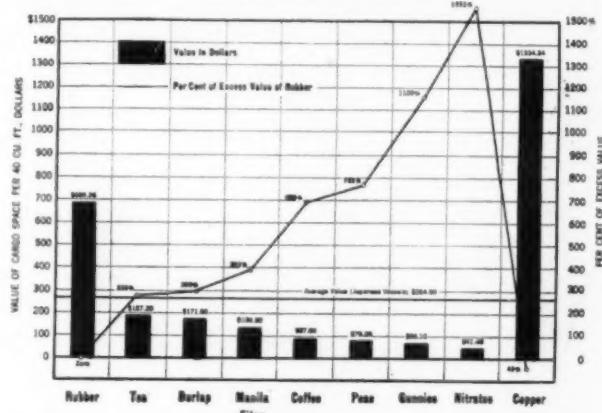
The money value of crude rubber in a unit of cargo space as compared with other commodities, shows an advantage in favor of rubber. For this purpose nine out of twenty-nine of the principal commodities imported in January and February, 1918, representing 198,835 long tons, value \$96,155,357, were taken for comparison. The nine products, including rubber, totaled 76,448 tons, value \$47,901,094, nearly 50 per cent of the 29 commodities in both tons and values.

The following table gives the merchandise values of these commodities to one cargo space unit of 40 cubic feet:

COMMODITIES	VALUE IN DOLLARS IN 40 CUBIC FEET.	EXCESS VALUE OF RUBBER.	PER CENT OF EXCESS VALUE OF RUBBER.
Rubber	\$685.20	.....	...
Tea	187.20	\$498.00	266
Burlaps	171.60	513.60	299
Manila fiber	139.20	546.00	392
Coffee	87.00	598.20	688
Peas	79.20	606.00	765
Gunnies	56.16	629.04	1,120
Nitrates	41.48	643.72	1,552
Copper	1,334.24	649.04	49

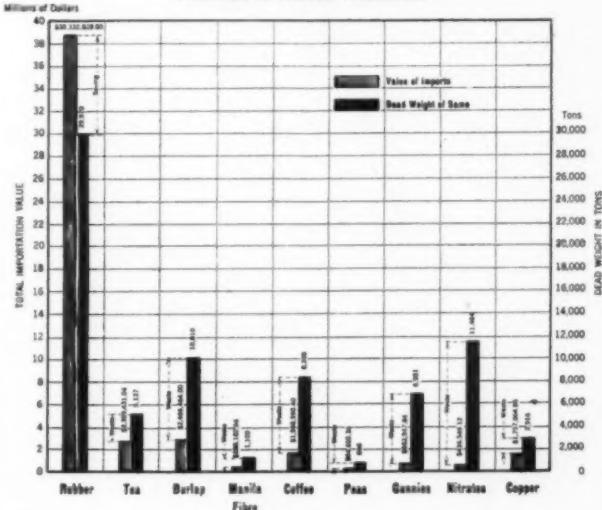
The advantage in favor of rubber is shown in the following graphs that illustrate the relative cubical contents, the dollar values and dead weights for the nine commodities.

CARGO SPACE VALUES



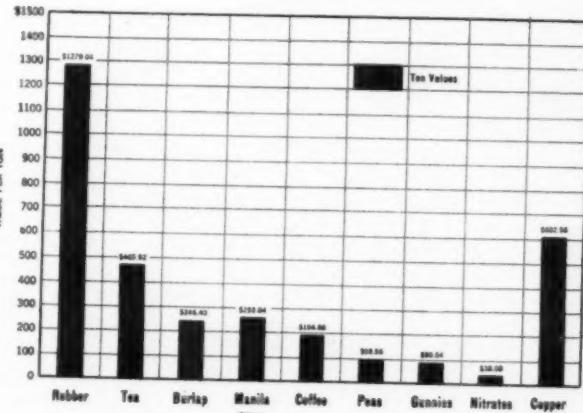
ILLUSTRATING THE RESPECTIVE VALUES PER 40 CUBIC FEET AND THE PERCENTAGES OF EXCESS VALUE OF RUBBER OVER THE OTHER COMMODITIES.

VALUES & DEAD WEIGHTS



ILLUSTRATING THE FACT THAT THE DOLLAR VALUE OF RUBBER EXCEEDS THE WEIGHT WHILE IN ALL OTHER CASES THE WEIGHT EXCEEDS THE DOLLAR VALUE.

TON VALUES



ILLUSTRATING THE DIFFERENT TON VALUES.

Specifications for Pneumatic Tires and Tubes Adopted by the Motor Transport Corps.

THE Pneumatic Tire Division of the War Service Committee of the Rubber Industry of the U. S. A. and representatives of the Motor Transport Corps of the War Department, held a meeting September 10 in Washington, District of Columbia, the following being present:

TIRE DIVISION—Paul W. Litchfield, chairman; E. H. Broadwell, vice-chairman; A. G. Partridge, W. O. Rutherford, J. C. Weston, Seneca G. Lewis, H. L. McLaren, O. R. Cook, J. S. Broughton, W. O'Neil, J. E. Baum, O. L. Weaver, W. W. Duncan, and M. L. Heminway, secretary.

MOTOR TRANSPORT CORPS—Major Kalb and Sergeant Wells. J. Newton Gunn, J. W. Thomas, G. M. Stadelman, S. P. Thatcher, W. E. Pfeiffer and A. R. Gormerly were also present.

The result of this meeting was the adoption of the following specifications by the Motor Transport Corps:

SPECIFICATIONS FOR PNEUMATIC MOTORCYCLE TIRE CASINGS, SIZE 28 BY 3.

SPECIFICATION NO. 1046.

FABRIC CONSTRUCTION.

1. GENERAL (a) Pneumatic motorcycle tire casings manufactured in accordance with this specification shall be of fabric construction of the size known as 28 by 3.

(b) The tire must give satisfactory service under a load of 325 pounds, when inflated to 40 pounds per square inch.

(c) Tires to be free from all defects and fully guaranteed as to material and workmanship.

(d) Tires shall be of the standard commercial non-skid design of the manufacturer furnishing the same. In case of a manufacturer using more than one non-skid tread design, selection of the design must be adopted at the option of the Motor Transport Service. A small section of the tire shall be submitted for approval before contract is let.¹

(e) The tires shall be plainly marked with manufacturer's name, serial number and size of tire and marked with either tag or label in colors of red, white or blue which will denote as follows: red, first four months of calendar year; white, second four months of calendar year; blue, last four months of calendar year. Years to be designated by square, triangle and round labels or tags—tags or labels to be approximately two inches in diameter.

(f) As soon as possible it is desired that all tires be marked with the equivalent millimeter sizes as recommended by the Society of Automotive Engineers.

2. TYPE All tires manufactured in accordance with this specification shall be of the clincher type, designed for the standard S. A. E. clincher motorcycle C. C. rim of the size 28 by 3.

3. CONSTRUCTION. (a) Splices on first ply of fabric shall be gum striped.

(b) Carcass of tire shall consist of at least four separate plies of tire duck with friction coat on two sides and skim coat on one side applied on a 45-degree bias. The gage of one ply frictioned on two sides and skim-coated on one shall be at least .043-inch. Each ply shall have not more than two splices which must be at least seven inches apart measured on the circumference of the tire. The splices in the tire shall be at least 3 inches apart when measured on the circumference of the tire.

(c) All fabrics must be square woven (23 by 23) from the long-staple cotton weighing 17½ ounces to the square yard with an allowable variance of plus or minus 3 per cent.

(d) All fabric must be thoroughly dried according to standard manufacturing practice, before it is started through the operations of rubberizing.

(e) The usual methods of inspection used by tire companies in commercial practice to discover defects in each roll of fabric shall be employed. The following tests shall be used to determine the strength of the fabric. All fabric shall be tested in a standard testing machine to determine the tensile strength. The distance between the grips on the machine shall be approximately 3 inches and the separation of the jaws shall be at the rate of 20 inches per minute. Six samples shall be cut from each roll in such a manner as to eliminate any unnecessary waste of material. Three samples shall be cut longitudinally to determine the warp strength and three samples shall be cut transversely to determine the filler strength. The samples shall be prepared in the following manner: unravel to 23 yards (1-inch width), heat until sample is "bone dry" and immediately test it in machine. The results must show a tensile strength of not less than 165 pounds per inch for either warp or filler.

(f) Beads shall be constructed with a rubber core filler as in standard commercial practice.

(g) One chafing strip of square-woven fabric weighing not less than 8 ounces per square yard shall be used. The chafing strip shall extend upward on each side of the tire at least 3½-inch from the channel of the bead.

(h) There shall be a cushion of rubber compound applied over the fabric which shall be wider than the breaker. The minimum gage of this cushion shall be .0325-inch.

(i) Over the cushion there shall be a single breaker strip of open-weave fabric such as is used in standard commercial practice, coated on both sides with a rubber compound having the physical and chemical properties of a nature to form a perfect union between the cushion and tread when the cure is effected. This breaker strip shall have a minimum width of 1¾ inches.

All sections for approval must be sent to Lieutenant George B. Wells, Engineering Division, Motor Transport Corps, 358 Union Station, Washington, District of Columbia.

¹As done in tread test.

Breaker shall be made from long staple cotton and shall weigh not less than eight ounces per square yard.

(j) The tread of the tire shall not be less than 34-inch thick in center, 1½-inch of which shall be the minimum thickness for the part of the tread under the middle of the non-skid portion.

(k) The sidewall of the tire shall have the minimum thickness of .045-inch.

4. PHYSICAL MEASUREMENTS AND TESTS. (a) Cross sectional diameter of each tire inflated according to the recommended weight and load schedule of the S. A. E. shall not be less than 2-15/16 nor more than 3.3 inches.

(b) Tire shall be capable of withstanding water pressure of 250 pounds per square inch without apparent injury. This test to be made at the discretion of the inspector.

(c) The strength of the union between the plies of fabric shall average 18 pounds or more per inch, using the standard friction test.

(d) The strength of the union between the breaker and tread and between the breaker and cushion shall average 28 pounds or more per inch, using the standard friction test.

(e) The strength of the union between the cushion and plies shall average 16 pounds or more per inch, using the standard friction test.

(f) The strength of the union between the sidewall and plies shall average 12 pounds or more per inch, using the standard friction test.

5. ROAD TEST. (a) Any manufacturer, bidding on orders for government business, must be prepared to meet the following testing conditions:

(i) No tires are to be given consideration by the Government unless the company submitting the bid tenders an affidavit stating that they maintain and properly check up tests on cars to properly test their pneumatic tire products and that these cars deliver an average of 2,000 tire miles weekly.

(2) The cars, speeds, loads and road conditions must be such that the tires are properly tested and the Government may appoint an inspector to see that the above conditions are complied with.

(3) A successful bidder must supply an affidavit before delivering any tires to the Government stating that the tires to be delivered are practically duplicates in construction and material of tires which he has previously tested and a sufficient number of tires satisfactory to the Motor Transport Service, at least six tires, have averaged on the rear wheels at least 4,000 miles.

6. LINING. The inside of each tire shall be properly lined in accordance with the standard practice of tire manufacturers.

7. FLAPS. Each tire casing shall have a flap cemented into the inside of the casing in accordance with the standard commercial practice.

8. COMPOUNDS. (a) **Tread**—The tread shall be made from and have the characteristics of a compound containing at least 65 per cent by volume of the best quality new wild or plantation rubber. Content of sulphur shall not exceed 8 per cent by weight of new rubber used. Compound shall be free from ingredients known to the rubber trade as "oil substitutes." The minimum tensile strength of the tread rubber shall be 2,600 pounds per square inch and shall have an elongation of not less than 450 per cent (2 inches to 11 inches). The set shall have a maximum of 25 (400 per cent or 2 inches to 10 inches when elongated for 10 minutes, using 2-inch sample with 10 minutes' rest before measuring).

(b) **Friction and Cushion**—These shall be made from and have the characteristics of a compound containing at least 75 per cent by volume of the best quality new wild or plantation rubber. Sulphur content shall not contain more than 8 per cent by weight of new rubber used.

(c) **Sidewalls**—The sidewalls shall be made from and have the characteristics of a compound containing a minimum of 65 per cent by volume of the best quality new wild or plantation rubber. Sulphur content shall not be more than 8 per cent by weight of new rubber used. Reclaimed rubber to the extent of 15 per cent of the total compound is allowable, but the amount and kind must be declared by the manufacturer. The minimum tensile strength of the sidewall rubber shall be 1,500 pounds per square inch with a minimum elongation of 450 per cent (2 inches to 11 inches) and a maximum set of 25 per cent.² The compound shall be free of ingredients known to the trade as "oil substitutes."

(d) The total sulphur in any of the above compounds shall not exceed 8 per cent of the weight of new rubber used except as follows: If the manufacturer desires to use sulphur-bearing mineral fillers, thereby causing the total sulphur to be over 8 per cent of the weight of new rubber, he may do so, but shall submit for analysis a sample of the finished unvulcanized stock. Such stock shall not show a sulphur content in the acetone extract of over 8 per cent of the weight of new rubber used.

9. INSPECTION. The Motor Transport Service reserves the right to make any inspection, test or analysis necessary to insure the product meeting all requirements of this specification.

10. PACKING. All tires shall be spirally wrapped according to standard practice and properly labeled on the outside showing size, type and name of manufacturer, and marked with either tag or label in colors of red, white or blue which will denote as follows: red, first four months of calendar year; white, second four months of calendar year; blue, last four months of calendar year; years to be designated by square, triangle and round labels or tags, tags or labels to be approximately two inches in diameter. Tires shipped for original equipment of cars shall be packed as specified by customer. In the case of overseas shipments, the specifications covering this shall be applied.

SPECIFICATIONS FOR PNEUMATIC MOTORCYCLE TIRE CASINGS, SIZE 29 BY 3½.

SPECIFICATION NO. 1065.

FABRIC CONSTRUCTION.

1. GENERAL. (a) Pneumatic motorcycle tire casings manufactured in accordance with this specification shall be of fabric construction of the size known to the trade as 29 by 3½.

(b) The tire must give satisfactory service under a load of 400 pounds, when inflated to 45 pounds per square inch.

(c) Tires to be free from all defects and fully guaranteed as to material and workmanship.

(d) Tires shall be of the standard commercial non-skid design of the manufacturer furnishing the same. In the case of a manufacturer using more than one non-skid tread design, selection of the design to be adopted is at the option of the Motor Transport Service. A small section of the tire shall be submitted for approval before contract is let.¹

(e) The tires shall be plainly marked with manufacturer's name, serial number and size of the tire, and marked with either tag or label in colors of red, white or blue, which will denote as follows: red, first four months of calendar year; white, second four months of calendar year; blue, last four months of calendar year; years to be designated by square, triangle and round labels or tags—tags or labels to be approximately two inches in diameter.

(f) As soon as possible it is desired that all tires be marked with the equivalent millimeter sizes as recommended by the Society of Automotive Engineers.

2. TYPE. All tires manufactured in accordance with this specification shall be of the clincher type, designed for the standard S. A. E. Clincher motorcycle CC rim of the size 28 by 3.

3. CONSTRUCTION. (a) Splices on first ply fabric shall be gum stripped.

(b) Carcass of tire shall consist of at least four separate plies of tire duck with friction coat on two sides and skim coat on one side applied on a 45-degree bias. The gage of one ply frictioned on two sides and skim coated on one shall be at least .043-inch. Each ply shall have not more than two splices which must be at least 7 inches apart measured on the circumference of the tire. The splices in the tire shall be at least 3 inches apart when measured on the circumference of the tire.

(c) All fabric must be square woven (23 by 23) from the best quality long-staple cotton, weighing 17 $\frac{1}{4}$ ounces to the square yard with an allowable variance of plus or minus 3 per cent.

(d) All fabric must be thoroughly dried according to standard manufacturing practice before it is started through the operations of rubberizing.

(e) The usual methods of inspection used by tire companies in commercial practice to discover defects in each roll of fabric shall be employed. The following tests shall be used to determine the strength of the fabric. All fabric shall be tested in a standard testing machine to determine the tensile strength. The distance between the grips on the machine shall be approximately 3 inches and the separation of the jaws shall be at the rate of 20 inches per minute. Six samples shall be cut from each roll in such a manner as to eliminate any unnecessary waste of material. Three samples shall be cut longitudinally to determine the warp strength and three samples shall be cut transversely to determine the filler strength unravel to 23 yards (1-inch width), heat until sample is "bone dry" and immediately test it in machine. The results must show a tensile strength of not less than 165 pounds per inch width for either warp or filler.

(f) Beads shall be constructed with a rubber core filler as in standard commercial practice.

(g) One chafing strip of square woven fabric weighing not less than 8 ounces per square yard to be used. The chafing strip shall extend upward on each side of the tire at least $\frac{1}{2}$ -inch from the channel of the bead.

(h) There shall be a cushion of rubber compound applied over the fabric which shall be wider than the breaker. The minimum gage of this cushion shall be .045-inch.

(i) Over the cushion there shall be a single breaker strip of open-weave fabric, such as is used in standard commercial practice, coated on both sides with a rubber compound having the physical and chemical properties of a nature to form a perfect union between the cushion and tread when the cure is effected. This breaker strip shall have a minimum width of 2 $\frac{1}{2}$ inches.

Breaker shall be made from long staple cotton weighing not less than eight ounces per square yard.

(j) The tread of the tire shall not be less than 5/16-inch thick in the center, $\frac{1}{8}$ -inch of which shall be the minimum thickness for the part of the tread under the middle of the non-skid portion.

(k) The sidewall of the tire shall have a minimum thickness of .050-inch.

4. PHYSICAL MEASUREMENTS AND TESTS. (a) Cross sectional diameter of each tire inflated according to the recommended weight and load schedule of the S. A. E. shall not be less than 3.4 nor more than 3.6 inches.

(b) Tire shall be capable of withstanding water pressure of 275 pounds per square inch without apparent injury. This test to be made at the discretion of the inspector.

(c) The strength of the union between the plies of fabric shall average 18 pounds or more per inch using the standard friction test.

(d) The strength of the union between the breaker and tread and between the breaker and cushion shall average 25 pounds or more per inch using the standard friction test.

(e) The strength of the union between the cushion and plies shall average 16 pounds or more per inch using the standard friction test.

(f) The strength of the union between the sidewall and plies shall average 12 pounds or more per inch using the standard friction test.

5. ROAD TEST. (a) Any manufacturer, bidding on orders for government business, must be prepared to meet the following testing conditions:

(1) No tires are to be given consideration by the Government unless the company submitting the bid tenders an affidavit stating that they maintain and properly check up tests on cars to properly test their pneumatic tire product, and that these cars deliver an average of 2,000 tire miles weekly.

(2) The cars, speeds, loads and road conditions must be such that the tires are properly tested and the Government may appoint an inspector to see that the above conditions are complied with.

(3) A successful bidder must supply an affidavit before delivering any tires to the government stating that the tires to be delivered are practically duplicates in construction and material of tires which he has previously tested properly and a sufficient number of tires satisfactory to the Motor Transport Service, at least six tires, have average on the rear wheels at least 4,000 miles.

6. LINING. The inside of each tire shall be properly lined in accordance with the standard practice of tire manufacturers.

7. FLAPS. Each tire casing shall have a flap cemented into the inside of the casing in accordance with the standard commercial practice.

8. COMPOUNDS. (a) Tread—The tread shall be made from and have the characteristics of a compound containing at least 65 per cent by volume of the best quality new wild or plantation rubber. Content of sulphur shall not exceed 8 per cent weight of new rubber used. Compound shall be free from ingredients known to the rubber trade as "oil substitutes." The minimum tensile strength of the tread rubber shall be 2,600 pounds per square inch and shall have an elongation of not less than 450 per cent (2 inches to 11 inches). The set shall have a maximum of 25 (400 per cent, or 2 to 10 inches when elongated for 10 minutes using a 2-inch sample with 10 minutes' rest before measuring).

(b) Friction and Cushion—These shall be made from and have the characteristics of a compound containing at least 75 per cent by volume of the best quality new wild or plantation rubber. Sulphur content shall not be more than 8 per cent by weight of new rubber used.

(c) Sidewalls—The sidewalls shall be made from and have the characteristics of a compound containing a minimum of 65 per cent by volume of the best quality new wild or plantation rubber. Sulphur content shall not be more than 8 per cent by weight of new rubber used. Reclaimed rubber to the extent of 15 per cent of the total compound is allowable, but the amount and kind must be declared by the manufacturer. The minimum

tensile strength of the sidewall rubber shall be 1,500 pounds per square inch with a minimum elongation of 450 (2 to 11 inches) and a maximum set of 25 per cent as done in tread test. Compound shall be free from ingredients known to the rubber trade as "oil substitutes."

(d) The total sulphur in any of the above compounds shall not exceed 8 per cent of the weight of new rubber used except as follows: if the manufacturer desires to use sulphur bearing mineral fillers, thereby causing the total sulphur to be over 8 per cent of the weight of the new rubber, he may do so, but shall submit for analysis a sample of the finished unvulcanized stock. Such stock shall not show a sulphur content in the acetone extract of over 8 per cent of the weight of new rubber used.

9. INSPECTION. The Motor Transport Service reserves the right to make any inspection or test or analysis necessary to insure the product meeting all requirements of this specification.

10. PACKING. All tires shall be spirally wrapped according to standard practice and proper labeled on the outside showing size, type and name of manufacturer, and marked with either tag or label in colors of red, white or blue which will denote as follows: red, first four months of calendar year; white, second four months of calendar year; blue, last four months of calendar year; years to be designated by square, triangle and round labels or tags, tags or labels to be approximately 2 inches in diameter. Tires shipped for original equipment of cars shall be packed as specified by customer. In the case of oversea shipments, the specifications covering this shall be applied.

SPECIFICATIONS FOR PNEUMATIC AUTOMOBILE TIRE CASINGS, SIZE 30 BY 3 $\frac{1}{2}$.

SPECIFICATION No. 1066.

FABRIC CONSTRUCTION.

1. GENERAL. (a) Pneumatic automobile casings manufactured in accordance with this specification shall be of fabric construction of the size known to the trade as 30 by 3 $\frac{1}{2}$.

(b) The tire must give satisfactory service under a load of 570 pounds when inflated to 55 pounds per square inch.

(c) Tires to be free from all defects and fully guaranteed as to material and workmanship.

(d) Tires shall be of the standard commercial non-skid design of the manufacturer furnishing the same. In the case of a manufacturer using more than one non-skid design, selection of the design to be adopted is at the option of the Motor Transport Service. A small section of the tire shall be submitted for approval before contract is let.¹

(e) The tires shall be plainly marked with manufacturer's name, serial number and the size, and marked with either tag or label in colors of red, white or blue, which shall denote as follows: red, first four months of the calendar year; white, second four months of the calendar year; blue, last four months of the calendar year; years to be designated by square, triangle and round labels or tags—tags or labels to be approximately 2 inches in diameter.

(f) As soon as possible it is desired that all tires be marked with the equivalent millimeter sizes as recommended by the Society of Automotive Engineers.

2. TYPE. All tires manufactured in accordance with this specification shall be of the clincher type, designed for the standard S. A. E. clincher rim of the size 30 by 3 $\frac{1}{2}$.

3. CONSTRUCTION. (a) Splices on the first ply of fabric shall be gum stripped.

(b) Carcass of tire shall consist of not less than four or more than five separate plies of tire duck, with friction coat on two sides and skim coat on one side applied on a 45-degree bias. The gage of one ply frictioned on two sides and skim-coated on one shall be at least .045-inch. Each ply shall have not more than two splices which must be at least 7 inches apart measured on the circumference of the tire. The splices in the tire shall be at least 3 inches apart when measured on the circumference of the tire.

(c) All fabric must be square woven (23 by 23) from the best quality Sea Island or Egyptian long staple cotton "or its physical equivalent" weighing 17 $\frac{1}{4}$ ounces to the square yard with an allowance variance of plus or minus 3 per cent.

(d) All fabric must be thoroughly dried according to standard manufacturing practice before it is started through the operations of rubberizing.

(e) The usual methods of inspection used by tire companies in commercial practice to discover defects in each roll of fabric shall be employed. The following tests shall be used to determine the strength of the fabric. All fabric shall be tested in a standard testing machine to determine the tensile strength. The distance between the grips on the machine shall be approximately 3 inches and the separation of the jaws shall be at the rate of 20 inches per minute. Six samples shall be cut from each roll in such a manner as to eliminate any unnecessary waste of material. Three samples shall be cut longitudinally to determine the warp strength and three samples shall be cut transversely to determine the filler strength. The samples shall be prepared in the following manner: unravel to 23 yards (1-inch width), heat until sample is "bone dry" and immediately test it in machine. The results must show a tensile strength of not less than 190 pounds per inch width for either warp or filler.

(f) Beads shall be constructed with a rubber core filler as in standard commercial practice.

(g) One chafing strip of square woven fabric weighing not less than 8 ounces per square yard shall be used. The chafing strip shall extend on each side of the tire at least $\frac{1}{2}$ -inch from the channel of the bead.

(h) There shall be a cushion of rubber compound applied over the fabric which shall be wider than the breaker. The minimum gage of this cushion shall be .045-inch.

(i) Over the cushion there shall be at least one breaker strip of open-weave fabric such as is used in standard commercial practice, coated on both sides with a rubber compound having the physical and chemical properties of a nature to form a perfect union between the cushion and tread when the cure is effected. This breaker strip shall have a minimum width of 2 $\frac{1}{2}$ inches.

Breaker shall be made from long staple cotton weighing not less than 8 ounces per square yard.

(j) The tread of the tire shall not be less than 5/16-inch thick in center, $\frac{1}{8}$ -inch of which shall be the minimum thickness for the part of the tread under the middle of the non-skid portion.

(k) The sidewall of the tire shall have a minimum thickness of .050-inch.

4. PHYSICAL MEASUREMENTS AND TESTS. (a) Cross sectional diameter of each tire inflated according to the recommended weight and load of the S. A. E. shall not be less than 3-7/16 inches (full size 30 by 3 $\frac{1}{2}$ preferred).

¹All sections for approval must be sent to Lieutenant George B. Wells, Engineering Division, Motor Transport Corps, 358 Union Station, Washington, District of Columbia.

(b) Tires shall be capable of withstanding water pressure of 300 pounds per square inch without apparent injury. This test to be made at the discretion of the inspector.

(c) Strength of the union between plies of fabric shall average 18 pounds or more per inch, using the standard friction test.

(d) Strength of the union between breaker and tread and between breaker and cushion shall average 28 pounds or more per inch, using the standard friction test.

(e) Strength of the union between sidewall and plies shall average 10 pounds or more per inch, using the standard friction test.

(f) Strength of the union between cushion and plies shall average 16 pounds or more per inch, using the standard friction test.

5. ROAD TEST. (a) Any manufacturer, bidding on orders for government business, must be prepared to meet the following testing conditions:

(1) No tires are to be given consideration by the Government unless the company submitting the bid tenders an affidavit stating that they maintain and properly check up tests on cars to properly test their pneumatic tire products and that these cars deliver an average of 8,000 tire miles weekly.

(2) The cars, speeds, loads and road conditions must be such that the tires are properly tested and the Government may appoint an inspector to see that the above conditions are complied with.

(3) A successful bidder must supply an affidavit before delivering any tires to the Government stating that the tires to be delivered are practically duplicates in construction and material of tires which he has previously tested properly and a sufficient number of tires satisfactory to the Motor Transport Service, at least six tires, have averaged on the rear wheels at least 4,000 miles.

6. LINING. The inside of each tire shall be properly lined in accordance with the standard practice of tire manufacturer.

7. FLAPS. No flaps shall be supplied.

8. COMPOUND. (a) Tread—The tread shall be made from and have the characteristics of a compound containing at least 65 per cent by volume of the best quality of new wild or plantation rubber. Content of sulphur shall not exceed 8 per cent by weight of new rubber used. The compound shall be free from ingredients known to the rubber trade as "oil substitutes." Minimum tensile strength of tread rubber shall be 2,600 pounds per square inch and shall have a maximum of 25 per cent (400 per cent of 2 to 10 inches when elongated for 10 minutes, using a sample with 10 minutes' rest before measuring).

(b) Friction and Cushion—These shall be made from and have the characteristics of a compound containing at least 75 per cent by volume of the best quality new wild or plantation rubber. Sulphur content shall not be more than 8 per cent by weight of new rubber used.

(c) Sidewalls. The sidewalls shall be made from and have the characteristics of a compound containing a minimum of 65 per cent by volume of the best quality of new wild or plantation rubber. Sulphur content shall not be more than 8 per cent by weight of new rubber used. Reclaimed rubber to the extent of 15 per cent by weight of total compound is allowable, but the amount and kind must be declared by the manufacturer. Compound shall have a minimum tensile strength of 1,500 pounds per square inch and a maximum set of 25 per cent. The compound shall be free from ingredients known to the rubber trade as "oil substitutes."

The total sulphur in any of the above compounds shall not exceed 8 per cent of the weight of new rubber used, except as follows: if the manufacturer desires to use sulphur bearing mineral fillers, thereby causing the total sulphur to be over 8 per cent of the weight of new rubber, he may do so, but shall submit for analysis a sample of the finished unvulcanized stock. Such stock shall not show a sulphur content in the acetone extract of over 8 per cent of the weight of new rubber used.

9. INSPECTION. The Motor Transport Service reserves the right to make any inspection, test or analysis necessary to insure the product meeting all requirements of this specification.

10. PACKING. All tires shall be spirally wrapped according to standard practice and properly labeled on the outside showing size, type and name of manufacturer, and marked with either tag or label in colors of red, white or blue, which will denote as follows: red, first four months of calendar year; white, second four months of calendar year; blue, last four months of calendar year; years to be designated by square, triangle and round labels or tags, tags or labels to be approximately 2 inches in diameter. Tires shipped for original equipment of cars shall be packed as specified by customer. In the case of oversea shipments, the specifications covering this shall be applied.

SPECIFICATIONS FOR PNEUMATIC AUTOMOBILE TIRE

CASINGS, SIZE 33 BY 4.

SPECIFICATION NO. 1067.

FABRIC CONSTRUCTION.

1. GENERAL. (a) Pneumatic automobile tire casings manufactured in accordance with this specification shall be of fabric construction of the size known to the trade as 33 by 4.

(b) The tire must give satisfactory service under a load of 815 pounds when inflated to 65 pounds per square inch.

(c) Tire to be free from all defects and fully guaranteed as to material and workmanship.

(d) Tires to be of the standard commercial non-skid design of the manufacturer furnishing the same. In the case of a manufacturer using more than one non-skid design, selection of the design to be adopted is at the option of the Motor Transport Service. A small section of the tire shall be submitted for approval before contract is let.¹

(e) The tires shall be plainly marked with manufacturer's name and the size of the tire, and marked with either tag or label in colors of red, white or blue, which will denote as follows: red, first four months of calendar year; white, second four months of calendar year; blue, last four months of calendar year; years to be designated by square, triangle and round labels or tags, tags or labels to be approximately 2 inches in diameter.

(f) As soon as possible it is desired that all tires be marked with the equivalent millimeter sizes as recommended by the Society of Automotive Engineers.

2. TYPE. All tires manufactured in accordance with this specification shall be of the straight side type designed for the standard S. E. A. straight side rim of the size 32 by 3½ or 33 by 4 new standard rim.

3. CONSTRUCTION. (a) Splices on the first ply of fabric shall be gum striped.

(b) Carcass of tire shall consist of not less than five or more than six separate plies of tire duck, with friction coat on two sides and skim coat

¹All sections for approval must be sent to Lieutenant George B. Wells, Engineering Division, Motor Transport Corps, 358 Union Station, Washington, District of Columbia.

on one side applied on a 45-degree bias. The gage of one ply frictioned on two sides and skim-coated on one shall be at least .045-inch. Each ply shall have not more than two splices which must be at least 7 inches apart measured on the circumference of the tire. The splices in the tire shall be at least 3 inches apart when measured on the circumference of the tire.

(c) All fabric must be square woven (23 by 23) from the best quality Sea Island or Egyptian long staple cotton or its physical equivalent weighing 17½ ounces to the square yard with an allowable variance of plus or minus 3 per cent.

(d) All fabric must be thoroughly dried according to standard manufacturing practice before it is started through the operations of rubberizing.

(e) The usual methods of inspection used by tire companies in commercial practice to discover defects in each roll of fabric shall be employed. The following tests shall be used to determine the strength of the fabric. All fabric shall be tested in a standard testing machine to determine the tensile strength. The distance between the grips on the machine shall be approximately 3 inches and the separation of the jaws shall be at the rate of 20 inches per minute. Six samples shall be cut from each roll in such a manner as to eliminate any unnecessary waste of material. Three samples shall be cut longitudinally to determine the warp strength and three samples shall be cut transversely to determine the filler strength. The samples shall be prepared in the following manner: unravel to 23 yarns (1-inch width), heat until sample is "bone dry" and immediately test it in machine. The results must show a tensile strength of not less than 180 pounds per inch width for either warp or filler.

(f) Beads shall be constructed with wire strands in the same manner as in the standard commercial practice. Tensile strength tests for wire strands as used by the individual tire manufacturers in the construction of beads will be satisfactory in so far as they are sufficient to preclude any chance of a bead stretching or blowing off the rim when under pressure.

(g) One chafing strip of square-woven fabric weighing not less than 8 ounces per square yard shall be used. The chafing strip shall extend upward on each side of the tire at least 1 inch from the heel of the bead.

(h) There shall be a cushion of rubber compound applied over the fabric which shall be wider than the breaker. The minimum gage of this cushion shall be .050-inch.

(i) Over the cushion there shall be at least one breaker strip of open-weave fabric such as is used in standard commercial practice, coated on both sides with a rubber compound having the physical and chemical properties of a nature to form a perfect union between the cushion and tread when the cure is effected. This breaker strip shall have a minimum width of 2½ inches.

Breaker shall be made from the best quality Sea Island or Egyptian cotton or its physical equivalent, and shall weigh not less than 10 ounces per square yard.

(j) The tread of the tire shall not be less than 3/16-inch thick at the center, 1/8-inch of which shall be the minimum thickness for the part of the tread under the middle of the non-skid portion.

(k) The sidewall of the tire shall have a minimum thickness of .050-inch.

4. PHYSICAL MEASUREMENTS AND TESTS. (a) Cross sectional diameter of each tire inflated according to the recommended weight and load schedule of the S. A. L. shall be not less than 4 inches.

(b) Tire shall be capable of withstanding water pressure of 300 pounds per square inch without apparent injury. This test to be made at the discretion of the inspector.

(c) Strength of union between plies of fabric shall average 18 pounds or more per inch, using the standard friction test.

(d) The strength of the union between breaker and tread and between breaker and cushion shall average 28 pounds or more per inch, using the standard friction test.

(e) Strength of union between sidewall and plies shall average 10 pounds or more per inch, using the standard friction test.

(f) Strength of the union between cushion and plies shall average 16 pounds or more per inch, using the standard friction test.

5. ROAD TEST. (a) Any manufacturer, bidding on orders for the government business, must be prepared to meet the following testing conditions:

(1) No tires are to be given consideration by the Government unless the company submitting the bid tenders an affidavit stating that they maintain and properly check up tests on cars to properly test their pneumatic tire products, and that these cars deliver an average of 8,000 tire miles weekly.

(2) The cars, speeds, loads and road conditions must be such that the tires are properly tested and the Government may appoint an inspector to see that the above conditions are complied with.

(3) A successful bidder must supply an affidavit before delivering any tires to the Government stating that the tires to be delivered are practically duplicates in construction and material of tires which he has previously tested properly and a sufficient number of tires satisfactory to the Motor Transport Service, at least six tires, have averaged on the rear wheels at least 4,000 miles.

6. LINING. The inside of each tire shall be properly lined in accordance with the standard practice of tire manufacturers.

7. FLAPS. A flap of the size 33 by 4 shall be furnished with each tire, as in standard commercial practice.

8. COMPOUNDS. (a) Tread—The tread shall be made from and have the characteristics of a compound containing at least 65 per cent by volume of the best quality of new wild or plantation rubber. Content of sulphur shall not exceed 8 per cent by weight of new rubber used. The compound shall be free from ingredients known to the rubber trade as "oil substitutes." Minimum tensile strength of tread rubber shall be 2,000 pounds per square inch and shall have a maximum set of 25 per cent (400 per cent of 2 to 10 inches when elongated for 10 minutes, using a 2-inch sample with 10 minutes' rest before measuring).

(b) Friction and Cushion—These shall be made from and have the characteristics of a compound containing at least 75 per cent by volume of the best quality new wild or plantation rubber. Sulphur content shall not be more than 8 per cent by weight of new rubber used.

Inspector shall have the privilege of taking a suitable sample for chemical analysis of the cushion stock and friction stock as it is just before being built into tire. The manufacturer may, if he desires, vulcanize this sample with a suitable cure before being sent out for test.

(c) Sidewall—The sidewall shall be made from and have the characteristics of a compound containing a minimum of 65 per cent by volume of the best quality new wild or plantation rubber. Sulphur content shall not be more than 8 per cent by weight of new rubber used. Reclaimed rubber to the extent of 15 per cent by weight of total compound is allowable, but the amount and kind must be declared by the manufacturer. Compound shall have a minimum tensile strength of 1,500 pounds per square inch

and a minimum elongation of 450 per cent (2 to 11 inches) and a maximum set of 25 per cent. The compound shall be free from ingredients known to the rubber trade as "oil substitutes."

The total sulphur in any of the above compounds shall not exceed 8 per cent of the weight of new rubber used, except as follows: if the manufacturer desires to use sulphur-bearing mineral fillers, thereby causing the total sulphur to be over 8 per cent of the weight of new rubber, he may do so, but shall submit for analysis a sample of the finished unvulcanized stock. Such stock shall not show a sulphur content in the acetone extract of over 8 per cent of the weight of new rubber used.

9. INSPECTION. The Motor Transport Service reserves the right to make any inspection, test or analysis necessary to insure the product meeting all requirements of this specification.

10. PACKING. All tires shall be spirally wrapped according to standard practice and properly labeled on the outside showing size, type and name of manufacturer, marked with either tag or label in colors, red, white or blue, which will denote as follows: red, first four months of calendar year; white, second four months of calendar year; blue, last four months of calendar year; years to be designated by square, triangle and round labels or tags, tags or labels to be approximately 2 inches in diameter. Tires shipped for original equipment of cars shall be packed as specified by customer. In the case of oversea shipments, the specifications covering this shall be applied. The compound shall be free from ingredients known to the rubber trade as "oil substitutes."

SPECIFICATIONS FOR PNEUMATIC AUTOMOBILE TIRE

CASINGS, SIZE 33 BY 4.

SPECIFICATION No. 1068.

CORD CONSTRUCTION.

1. GENERAL. (a) Pneumatic automobile tire casings manufactured in accordance with this specification shall be of cord construction of the size known to the trade as 33 by 4.

(b) The tire must give satisfactory service under a load of 815 pounds when inflated to 65 pounds per square inch.

(c) Tires to be free from all defects and fully guaranteed as to material and workmanship.

(d) Tires shall be of the standard commercial non-skid design of the manufacturer furnishing the same, or of rib tread design as specified on the order. In the case of a manufacturer using more than one non-skid tread design, selection of the design to be adopted is at the option of the Motor Transport Service. A small section of the tire shall be submitted for approval before contract is let.

(e) All tires shall be branded with the manufacturer's name, size of tire, serial number and marked with either tag or label in colors of red, white or blue, which will denote as follows: red, first four months of calendar year; white, second four months of calendar year; blue, last four months of calendar year. Years to be designated by square, triangle and round labels or tags. Tags or labels to be approximately 2 inches in diameter.

(f) As soon as possible, it is desired that all tires be marked with the equivalent millimeter sizes as recommended by the Society of Automotive Engineers.

2. TYPE. All tires manufactured in accordance with this specification shall be of the straight side type, designed for the standard S. A. E. straight side rim of the size 32 by 3½ inches or 33 by 4 new standard rim.

3. CONSTRUCTION. (a) Carcass of tire shall consist of no less than four and no more than eight separate plies of cord applied in such a manner that an equal number of plies shall run in each diagonal direction across the tire.

(b) All cord material to be of the best quality combed Sea Island or Egyptian cotton, or its physical equivalent.

(c) All cord fabric must be thoroughly dried according to standard manufacturing practice before it is started through the operations of rubberizing.

(d) The usual methods of inspection used by tire companies in commercial practice to discover defects in each roll of cord fabric shall be employed, and tests to determine the tensile strength of cords shall be made on ten individual cords taken from each roll. These tests shall be made in the following manner:

The individual cords shall be tested in a fabric testing machine in which the distance between grips is approximately 10 inches, which grips separate at the rate of 20 inches per minute. The results shown must be up to the standard specification of the individual manufacturer.

(e) Beads shall be constructed with wire strands in the same manner as in standard commercial practice. Tensile strength tests for wire strands as used by the individual tire manufacturers in the construction of beads will be satisfactory in so far as they are sufficient to preclude any chance of a bead stretching or blowing off the rim when under pressure.

(f) Two chafing strips of fabric weighing not less than 8 ounces per square yard shall be used. Each chafing strip must extend upward on each side of the tire at least 1 inch from the heel of the bead. One chafing strip shall extend at least 3½-inch above the other.

(g) There shall be a cushion of rubber compound applied over the cords which shall be wider than the breaker. The minimum gage of this cushion shall be .050-inch.

(h) Over the cushion there shall be at least one breaker strip of open-weave fabric such as is used in standard commercial practice, coated on both sides with a rubber compound having the physical and chemical properties of a nature to form a perfect union between the cushion and tread when the cure is effected. This breaker strip shall have a minimum width of 3 inches.

Breaker shall be made from the best quality of Sea Island or Egyptian cotton, or its physical equivalent, and shall weigh not less than 10 ounces per square yard.

(i) The tread of the tire shall not be less than 3/16-inch thick in the center, 1/8-inch of which shall be the minimum thickness for the part of the tread under the middle of the non-skid portion.

(j) The sidewall of the tire shall have a minimum thickness of .0625-inch.

4. PHYSICAL MEASUREMENTS AND TESTS. (a) Cross sectional diameter of each tire inflated according to the recommended weight and load schedule of the S. A. E. shall be 4.1 inches.

(b) Tire shall be capable of withstanding water pressure of 350 pounds per square inch without apparent injury. This test to be made at the discretion of the inspector.

(c) The minimum strength of the tire shall be 2,000 pounds. This "strength factor" is the product of the number of cords per inch measured at the tread at right angles to the cords; times strength of individual cord as

¹All sections for approval must be sent to Lieutenant George B. Wells, Engineering Division, Motor Transport Corps, 358 Union Station, Washington, District of Columbia.

taken from the cord tire: times the number of plies.

(d) The strength of the union between breaker and tread and between breaker and cushion shall average 32 pounds or more per inch, using the standard friction test.

(e) Strength of the union between sidewall and plies shall average 14 pounds or more per inch, using the standard friction test.

(f) Strength of the union between cushion and plies shall average 16 pounds or more per inch, using the standard friction test.

5. ROAD TEST. (a) Any manufacturer, bidding on orders for government business, must be prepared to meet the following testing conditions:

(1) No tires are to be given consideration by the Government unless the company submitting the bid tenders an affidavit stating that they maintain and properly check up tests on cars to properly test their pneumatic product, and that these cars deliver an average of 8,000 tire miles weekly.

(2) The cars, speeds, loads and road conditions must be such that the tires are properly tested and the Government may appoint an inspector to see that the above conditions are complied with.

(3) A successful bidder must supply an affidavit before delivering any tires to the Government, stating that the tires to be delivered are practically duplicates in construction and material of tires which he has previously tested properly, and a sufficient number of tires satisfactory to the Motor Transport Service, at least six tires, have averaged on the rear wheels at least 5,000 miles.

6. LINING. The inside of each tire shall be properly lined in accordance with the standard practice of tire manufacturers.

7. FLAPS. A flap of the size 33 by 4 shall be furnished with each tire as in standard commercial practice.

8. COMPOUNDS. (a) Tread—The tread shall be made from and have the characteristics of a compound containing at least 70 per cent by volume of the best new rubber, content of sulphur shall not exceed 8 per cent by weight of the new rubber used. Compound shall contain no reclaimed rubber, minimum tensile strength of tread rubber shall be 2,600 pounds per square inch and shall have a minimum set of 25 per cent. Set test shall be made by stretching 2 to 10 inches and holding for 10 minutes. Rest sample for 10 minutes and then measure the per cent of elongation over the original length.

(b) Friction and Cushion—These shall be made from and have the characteristics of a compound containing at least 85 per cent by volume of the best quality new wild or plantation rubber. Sulphur content shall not be more than 8 per cent by weight of new rubber used. No reclaimed rubber shall be used.

(c) Sidewall—The sidewall shall be made from and have the characteristics of a compound containing a minimum of 65 per cent by volume of the best quality new wild or plantation rubber. Sulphur content shall not be more than 8 per cent of weight of new rubber used. No reclaimed rubber can be used. Compound shall have a minimum tensile strength of 1,800 pounds per square inch and a minimum elongation of 450 per cent (2 to 11 inches) and a maximum set of 25 per cent. The compound shall be free of ingredients known to the rubber trade as "oil substitutes."

(d) The total sulphur in any of the above compounds shall not exceed 8 per cent of the weight of new rubber used except as follows: if the manufacturer desires to use sulphur bearing mineral fillers, thereby causing the total sulphur to be over 8 per cent of the weight of new rubber, he may do so, but shall submit for analysis a sample of the finished unvulcanized stock. Such stock shall not show a sulphur content in the acetone extract of over 8 per cent of the weight of new rubber used.

9. INSPECTION. The Motor Transport Service reserves the right to make any inspection, test, or analysis necessary to insure the product meeting all requirements of this specification.

10. PACKING. All tires shall be spirally wrapped according to standard practice and properly labelled on the outside showing size, type and name of manufacturer, and marked with either tag or label in colors of red, white or blue, which will denote as follows: red, first four months of calendar year; white, second four months of calendar year; blue, last four months of calendar year; years to be designated by square, triangle and round labels or tags—tags or labels to be approximately 2 inches in diameter. Tires shipped for original equipment of cars shall be packed as specified by customer. In the case of oversea shipments, the specifications covering this shall be applied.

SPECIFICATIONS FOR PNEUMATIC AUTOMOBILE TIRE

CASINGS, SIZE 35 BY 5.

SPECIFICATION No. 1069.

CORD CONSTRUCTION.

1. GENERAL. (a) Pneumatic automobile tire casings manufactured in accordance with this specification shall be of cord construction, of the size known to the trade as 35 by 5 inches.

(b) The tire must give satisfactory service under a load of 1,300 pounds when inflated to 75 pounds per square inch.

(c) Tires to be free from all defects and fully guaranteed as to material and workmanship.

(d) Tires shall be of the standard commercial non-skid design of the manufacturer furnishing the same, or of rib tread design as specified on the order. In the case of a manufacturer using more than one non-skid tread design, selection of the design to be adopted is at the option of the Motor Transport Service. A small section of the tire shall be submitted for approval before contract is let.¹

(e) The tires shall be plainly marked with manufacturer's name, serial number and size of tire and marked with either tag or label in colors of red, white or blue which will denote as follows: red, first four months of calendar year; white, second four months of calendar year; blue, last four months of calendar year, years to be designated by square, triangle and round labels or tags—tags or labels to be approximately 2 inches in diameter.

(f) As soon as possible, it is desired that all tires be marked with the equivalent millimeter sizes as recommended by the Society of Automotive Engineers.

2. TYPE. All tires manufactured in accordance with this specification shall be of the straight side type, designed for the standard S. A. E. straight side rim of the size 34 by 4½ inches.

3. CONSTRUCTION. (a) Carcass of tire shall consist of no less than four and no more than ten separate plies of cord applied in such a manner that an equal number of plies shall run in each diagonal direction across the tire.

(b) All cord material to be of the best quality combed Sea Island, or Egyptian cotton, or its physical equivalent.

(c) All cord fabrics must be thoroughly dried according to standard manufacturing practice before it is started through the operations of rubberizing.

(d) The usual methods of inspection used by tire companies in commercial practice to discover defects in each roll of cord fabric shall be employed, and tests to determine the tensile strength of cords shall be made in ten individual cords taken from each roll. These tests shall be made in the following manner:

The individual cords shall be tested in a fabric testing machine in which the distance between grips is approximately 10 inches, which grips separate at the rate of 20 inches per minute. The results shown must be up to the standard specification of the individual manufacturer.

(e) Beads shall be constructed with wire strands in the same manner as in standard commercial practice. Tensile strength tests for wire strands as used by the individual tire manufacturers in the construction of beads will be satisfactory in so far as they are sufficient to preclude any chance of a bead stretching or blowing off the rim when under pressure.

(f) Two chafing strips of fabric weighing not less than 8 ounces per square yard shall be used. Each chafing strip must extend upward on each side of the tire at least 1½ inches from the heel of the bead. One chafing strip shall extend at least 3/16-inch from the other.

(g) There shall be a cushion or rubber compound applied over the cords which shall be wider than the breaker. The minimum gage of this cushion shall be .0625 inch.

(h) Over the cushion there shall be at least one breaker strip of open-weave fabric such as is used in standard commercial practice, coated on both sides with a rubber compound having the physical and chemical properties of a nature to form a perfect union between the cushion and tread when the cure is effected. This breaker strip shall have a minimum width of 3½ inches. Breaker shall be made from the best quality Sea Island or Egyptian cotton, or its physical equivalent, and shall weigh not less than 10 ounces per square yard.

(i) The tread of the tire shall not be less than 7/16-inch thick in center, 3/16-inch of which shall be the minimum thickness for the part of the tread under the middle of the non-skid portion.

(j) The sidewall of the tire shall have a minimum thickness of .0625 inch.

4. PHYSICAL MEASUREMENTS AND TESTS. (a) Cross sectional diameter of each tire inflated according to the recommended weight and load schedule of the S. A. E. shall be not less than 5.2 inches.

(b) Tire shall be capable of withstanding water pressure of 350 pounds per square inch without apparent injury. This test to be made at the discretion of the inspector.

(c) The minimum strength of the tire shall be 2,500 pounds. This "strength factor" is the product of the number of cords per inch measured at the tread at right angles to the cords; times strength of individual cord as taken from the cord tire; times the number of plies.

(d) The strength of the union between breaker and tread and between breaker and cushion shall average 32 pounds, or more, per inch, using the standard friction test.

(e) Strength of the union between sidewall and plies shall average 14 pounds, or more, per inch, using the standard friction test.

(f) Strength of the union between sidewall and plies shall average 16 pounds or more per inch, using the standard friction test.

5. ROAD TEST. (a) Any manufacturer bidding on orders for government business must be prepared to meet the following testing conditions:

(b) No tires are to be given consideration by the Government unless the company submitting the bid tenders an affidavit stating that they maintain and properly check up tests on cars to properly test their pneumatic tire product and that these cars deliver an average of 8,000 tire miles weekly.

(c) The cars, speeds, loads, and road conditions must be such that the tires are properly tested and the Government may appoint an inspector to see that the above conditions are properly met.

(d) A successful bidder must supply an affidavit before delivering tires to the Government stating that the tires to be delivered are practically duplicates in construction and material of tires which he has previously tested properly and a sufficient number of tires satisfactory to the Motor Transport Service, at least six tires, having averaged on the rear wheels at least 5,000 miles.

6. LINING. The inside of each tire shall be properly lined in accordance with the standard practice of tire manufacturers.

7. FLAPS. A flap of the size 35 by 5 shall be furnished with each tire, as in standard commercial practice.

8. COMPOUND. (a) The tread shall be made from and have the characteristics of a compound containing at least 70 per cent by volume of the best new rubber. Content of sulphur shall not exceed 8 per cent by weight of the new rubber used. Compound shall contain no reclaimed rubber. Minimum tensile strength of tread rubber shall be 2,600 pounds per square inch and shall have a minimum set of 25 per cent. Set test shall be made by stretching 2 to 10 inches and holding for 10 minutes, resting sample for 10 minutes and then measuring the per cent of elongation over the original length.

(b) Friction and Cushion—These shall be made from and have the characteristics of a compound containing at least 85 per cent by volume of the best quality new wild or plantation rubber. Sulphur content shall not contain more than 8 per cent by weight of new rubber used. No reclaimed rubber shall be used.

(c) Sidewall—The sidewall shall be made from and have the characteristics of a compound containing a minimum of 65 per cent by volume of the best quality new wild or plantation rubber. Sulphur content shall not be more than 8 per cent of weight of new rubber used. No reclaimed rubber can be used. Compound shall have a minimum tensile strength of 1,800 pounds per square inch and a minimum elongation of 450 per cent (2 to 11 inches) and a maximum set of 25 per cent. The compound shall be free of ingredients known to the rubber trade as "oil substitutes."

(d) The total sulphur in any of the above compounds shall not exceed 8 per cent of the weight of new rubber used except as follows: if the manufacturer desires to use sulphur-bearing mineral fillers, thereby causing the total sulphur to be over 8 per cent of the weight of new rubber, he may do so but shall submit for analysis a sample of the finished uncleaned stock. Such stock shall not show a sulphur content in the acetone extract of over 8 per cent of the weight of new rubber used.

9. INSPECTION. The Motor Transport Service reserves the right to make any inspection or test, or analysis necessary to insure the product meeting all requirements of this specification.

10. PACKING. All tires shall be spirally wrapped according to standard practice and properly labelled on the outside showing size, type, name of manufacturer, serial number and marked with either tag or label in colors of red, white or blue which will denote as follows: red, first four months of calendar year; white, second four months of calendar year; blue, last four months of calendar year, years to be designated by square, triangle and round labels or tags, tags or labels to be approximately 2 inches in diameter. Tires shipped for original equipment of cars shall be packed as

specified by customer. In the case of oversea shipments, the specifications covering this shall be applied.

SPECIFICATIONS FOR PNEUMATIC AUTOMOBILE TIRE CASINGS, SIZE 36 BY 6.

SPECIFICATION NO. 1070. CORD CONSTRUCTION.

1. GENERAL. (a) Pneumatic automobile tire casings manufactured in accordance with this specification shall be of cord construction of the size known to the trade as 36 by 6 inches.

(b) The tire must give satisfactory service under a load of 2,000 pounds, when inflated to 90 pounds per square inch.

(c) Tires to be free from all defects and fully guaranteed as to material and workmanship.

(d) Tires shall be of the standard commercial non-skid design of the manufacturer furnishing the same, or of rib tread design as specified on the order. In the case of a manufacturer using more than one non-skid tread design, selection of the design to be adopted is at the option of the Motor Transport Corps. A small section of the tire shall be submitted for approval before contract is let.

(e) All tires shall be plainly marked with manufacturer's name and the size of the tire and marked with either tag or label in colors of red, white or blue, which shall denote as follows: red, first four months of calendar year; white, second four months of calendar year; and blue, last four months of calendar year. Years to be designated by square, triangle and round label or tags—tags or labels to be approximately two inches in diameter.

(f) As soon as possible it is desired that all tires be marked with the equivalent millimeter sizes as recommended by the Society of Automotive Engineers.

2. TYPE. All tires manufactured in accordance with this specification shall be of the straight side rim of the size 36 by 6 inches.

3. CONSTRUCTION. (a) Carcass of tire shall consist of no less than four and no more than twelve separate plies of cord applied in such a manner that an equal number of plies shall run in each diagonal direction across the tire.

(b) All cord material to be of the best quality, combed Sea Island or Egyptian cotton, or its physical equivalents.

(c) All cord fabric must be thoroughly dried according to standard manufacturing practice, before it is started through the operations of rubberizing.

(d) The usual methods of inspection used by tire companies in commercial practice to discover defects in each roll of cord fabric, shall be employed, and tests to determine the tensile strength of cords shall be made on ten individual cords taken from each roll. These tests shall be made in the following manner:

The individual cords shall be tested in a fabric testing machine in which the distance between grips is approximately 10 inches, which grips separate at the rate of 20 inches per minute. The results shown must be up to the standard specifications of the individual manufacturer.

(e) Beads shall be constructed with wire strands in the same manner as in standard commercial practice. Tensile strength tests for wire strands as used by the individual tire manufacturers in the construction of beads will be satisfactory in so far as they are sufficient to preclude any chance of a bead stretching or blowing off the rim when under pressure.

(f) Two chafing strips of fabric weighing not less than 8 ounces per square yard shall be used. Each chafing strip must extend upward on each side of the tire at least 1½ inches from the heel of the bead. One chafing strip shall extend at least 3/16-inch above the other.

(g) There shall be a cushion of rubber compound applied over the cords which shall be wider than the breaker. The minimum gage of this cushion shall be .080-inch.

(h) Over the cushion there shall be at least one breaker strip of open-weave fabric such as is used in standard commercial practice, coated on both sides with a rubber compound having the physical and chemical properties of a nature to form a perfect union between the cushion and tread when the cure is effected. This breaker strip shall have a minimum width of 3½ inches. Breaker shall be made from the best quality Set Island or Egyptian cotton, or its physical equivalent.

(i) The tread of the tire shall not be less than 9/16-inch thick, 7/32-inch of which shall be the minimum thickness for the part of the tread under the middle of the non-skid portion.

(j) The sidewall of the tire shall have a minimum thickness of .0625 inch.

4. PHYSICAL MEASUREMENTS AND TESTS. (a) Cross sectional diameter of each tire inflated according to the recommended weight and load schedule of the S. A. E. shall be not less than 6.2 inches.

(b) Tires shall be capable of withstanding water pressure of 350 pounds per square inch without apparent injury. This test to be made at the discretion of the inspector.

(c) The minimum strength of the tire shall be 3,000 pounds. This "strength factor" is the product of the number of cords per inch measured at the tread at right angles to the cords; times strength of individual cord as taken from the cord tire; times the number of plies.

(d) The strength of the union between breaker and tread and between breaker and cushion shall average 32 pounds or more per inch, using the standard friction test.

(e) Strength of the union between sidewall and plies shall average 14 pounds or more per inch, using standard friction test.

(f) Strength of the union between cushion and plies shall average 26 pounds or more per inch, using the standard friction test.

5. ROAD TESTS. Any manufacturer bidding on orders for the government business must be prepared to meet the following testing conditions:

(1) No tires are to be given consideration by the Government unless the company submitting the bid tenders an affidavit stating that they maintain and properly check up tests on cars to properly test their pneumatic tire product and that these cars deliver an average of 8,000 tire miles weekly.

(2) The cars, speeds, loads, and road conditions must be such that the tires are properly tested and the Government may appoint an inspector to see that the above conditions are complied with.

(3) A successful bidder must supply an affidavit before delivering any tires to the Government stating that the tires to be delivered are practically duplicates in construction and material of tires which he has previously tested properly and a sufficient number of tires satisfactory to the Motor Transport Service, at least six tires, have averaged on the rear wheels at least 5,000 miles.

6. LINING. The inside of each tire shall be properly lined in accordance with the standard practice of tire manufacturers.

7. FLAPS. A flap of the size 36 by 6 shall be furnished with each tire as in standard commercial practice.

¹All sections for approval must be sent to Lieutenant George B. Wells, Engineering Division, Motor Transport Corps, 358 Union Station, Washington, District of Columbia.

8. COMPOUNDS. (a) The tread shall be made from and have the characteristics of a compound containing at least 70 per cent by volume of the best new rubber. Content of sulphur shall not exceed 8 per cent by weight of the new rubber used. Compound shall contain no reclaimed rubber. Minimum tensile strength of tread rubber shall be 2,600 pounds per square inch and shall have a minimum set of 25 per cent. Set test shall be made by stretching 2 to 10 inches and holding for 10 minutes. Rest sample for 10 minutes and then measure the per cent of elongation over the original length.

(b) Friction and Cushion—These shall be made from and have the characteristics of a compound containing at least 85 per cent by volume of the best quality new wild or plantation rubber. Sulphur content shall not be more than 8 per cent by weight of new rubber used. No reclaimed rubber shall be used.

(c) Sidewall—The sidewall shall be made from and have the characteristics of a compound containing a minimum of 65 per cent by volume of the best quality new wild or plantation rubber. Sulphur content shall not be more than 8 per cent by weight of new rubber used. No reclaimed rubber shall be used. Compound shall have a minimum tensile strength of 1,800 pounds per square inch, and a minimum elongation of 450 per cent (2 to 11 inches) and a maximum set of 25 per cent. The compound shall be free of ingredients known to rubber trade as "oil substitutes."

(d) The total sulphur in any of the above compounds shall not exceed 8 per cent of the weight of new rubber used except as follows: if the manufacturer desires to use sulphur bearing fillers, thereby causing the total sulphur to be over 8 per cent of the weight of new rubber, he may do so but shall submit for analysis a sample of the finished unvulcanized stock. Such stock shall not show a sulphur content in the acetone extract of over 8 per cent of the weight of new rubber used.

9. INSPECTION. The Motor Transport Service reserves the right to make any inspection or test or analysis necessary to insure the product meeting all the requirements of this specification.

10. PACKING. All tires shall be spirally wrapped according to standard practice and properly labelled on the outside showing size, type and name of manufacturer and marked with either tag or label in colors of red, white or blue which will denote as follows: red, first four months of calendar year; white, second four months of calendar year; blue, last four months of calendar year—years to be designated by square, triangle and round labels or tags. Tags or labels to be approximately 2 inches in diameter. Tires shipped for original equipment of cars shall be packed as specified by customer. In the case of oversea shipment, the specifications covering this shall be applied.

SPECIFICATIONS FOR PNEUMATIC AUTOMOBILE TIRE CASINGS, SIZE 38 BY 7.

SPECIFICATION NO. 1071.

CORD CONSTRUCTION.

1. GENERAL. (a) Pneumatic automobile tire casings manufactured in accordance with this specification shall be of cord construction of the size known with the trade as 38 by 7 inches.

(b) The tire must give satisfactory service under a load of 2,700 pounds, when inflated to 100 pounds per square inch.

(c) Tires to be free from all defects and fully guaranteed as to material and workmanship.

(d) Tires shall be of the standard commercial non-skid design of the manufacturer furnishing the same, or of rib tread design as specified on the order. In the case of a manufacturer using more than one non-skid tread design, selection of the design to be adopted is at the option of the Motor Transport Service. A small section of the tire shall be submitted for approval before contract is let.

(e) The tires shall be plainly marked with manufacturers' name, serial number and size of tire and marked with either tag or label in colors of red, white or blue, which will denote as follows: red, first four months of calendar year; white, second four months of calendar year; blue, last four months of calendar year—years to be designated by square, triangle and round labels or tags—tags or labels to be approximately 2 inches in diameter.

(f) As soon as possible it is desired that all tires be marked with the equivalent millimeter sizes as recommended by the Society of Automotive Engineers.

2. TYPE. All tires manufactured in accordance with this specification shall be of the straight side type, designed for the standard S. A. E. straight side rim of the size 36 by 6 inches or 38 by 7 inches.

3. CONSTRUCTION. (a) Carcass of tire shall consist of no less than four and no more than fourteen separate plies of cord applied in such a manner that an equal number of plies shall run in each diagonal direction across the tire.

(b) All cord material to be of the best quality combed Sea Island, or Egyptian cotton or its physical equivalent.

(c) All cord fabric must be thoroughly dried according to standard manufacturing practice, before it is started through the operations of rubberizing.

(d) The usual methods of inspection used by tire companies in commercial practice to discover defects in each roll of cord fabric, shall be employed, and tests to determine the tensile strength of cords shall be made in the individual cords taken from each roll. These tests shall be made in the following manner:

The individual cords shall be tested in a fabric testing machine in which the distance between grips is approximately 10 inches, which grips separate at the rate of 20 inches per minute. The results shown must be up to the standard specification of the individual manufacturer.

(e) Beads shall be constructed with wire strands in the same manner as in standard commercial practice. Tensile strength tests for wire strands as used by the individual tire manufacturers in the construction of beads will be satisfactory in so far as they are sufficient to preclude any chance of a bead stretching or blowing off the rim when under pressure.

(f) Two chafing strips of fabric weighing not less than 12 ounces per square yard, shall be used. Each chafing strip must extend upward on each side of the tire at least 1 1/4 inches from the heel of the bead. One chafing strip shall extend at least 1/4-inch above the other.

(g) There shall be a cushion of rubber compound applied over the cords which shall be wider than the breaker. The minimum gage of this cushion shall be .080-inch.

(h) Over the cushion there shall be at least one breaker strip of open-weave fabric such as is used in standard commercial practice, coated on both sides with a rubber compound having the physical and chemical properties of a nature to form a perfect union between the cushion and

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tread when the cure is effected. This breaker strip shall have a minimum width of 3 1/2 inches.

Breaker shall be made from the best quality Sea Island or Egyptian cotton or its physical equivalent and shall weigh not less than 10 ounces per square yard.

(i) The tread of the tire shall not be less than 5/8-inch thick, 3/4-inch of which shall be the minimum thickness for the part of the tread under the middle of the non-skid portion.

(j) The sidewall of the tire shall have a minimum thickness of .0625-inch.

4. PHYSICAL MEASUREMENTS AND TESTS. (a) Cross sectional diameter of each tire inflated according to the recommended weight and load schedule of the S. A. E. shall not be less than 7.25 inches.

(b) Tire shall be capable of withstanding water pressure of 350 pounds per square inch without apparent injury. This test to be made at the discretion of the inspector.

(c) The minimum strength of the tire shall be 3,500 pounds. This "strength factor" is the product of the number of cords per inch measured at the tread at right angles to the cords; times strength of individual cord as taken from the cord tire; times the number of plies.

(d) The strength of the union between breaker and tread and between breaker and cushion shall average 32 pounds or more per inch, using the standard friction test.

(e) Strength of the union between sidewall and plies shall average 14 pounds or more per inch, using the standard friction test.

(f) Strength of the union between cushion and plies shall average 16 pounds or more per inch, using the standard friction test.

5. ROAD TESTS. Any manufacturer bidding on orders for government business must be prepared to meet the following testing conditions:

(1) No tires are to be given consideration by the Government unless the company submitting the bid tenders an affidavit stating that they maintain and properly check up tests on cars to properly test their pneumatic tire product and that these cars deliver an average of 8,000 tire miles weekly.

(2) The cars, speed, loads, and road conditions must be such that the tires are properly tested and the Government may appoint an inspector to see that the above conditions are complied with.

(3) A successful bidder must supply an affidavit before delivering any tires to the Government stating that the tires to be delivered are practically duplicates in construction and material of tires which he has previously tested properly and a sufficient number of tires satisfactory to the Motor Transport Service, at least six tires, have averages on the rear wheels of at least 5,000 miles.

6. LINING. The inside of each tire shall be properly lined in accordance with the standard practice of the manufacturer.

7. FLAPS. A flap of the size 38 by 7 shall be furnished with each tire as in standard commercial practice.

8. COMPOUNDS. (a) Tread—The tread shall be made from and have the characteristics of a compound containing at least 70 per cent by volume of the best new rubber. Content of sulphur shall not exceed 8 per cent by weight of the new rubber used. Compound shall contain no reclaimed rubber. Minimum tensile strength of tread rubber shall be 2,600 pounds per square inch and shall have a minimum set of 25 per cent. Set test shall be made by stretching 2 to 10 inches and holding for 10 minutes. Rest sample for 10 minutes and then measure the per cent of elongation over the original length.

(b) Friction and Cushion—These shall be made from and have the characteristics of a compound containing at least 85 per cent by volume of the best quality new wild or plantation rubber. Sulphur content shall not be more than 8 per cent by weight of new rubber used. No reclaimed rubber shall be used.

(c) Sidewall—The sidewall shall be made from and have the characteristics of a compound containing a minimum of 65 per cent by volume of the best quality new wild or plantation rubber. Sulphur content shall not be more than 8 per cent by weight of new rubber used. No reclaimed rubber can be used. Compound shall have a minimum tensile strength of 1,800 pounds per square inch and a minimum elongation of 450 per cent (2 to 11 inches) and a maximum set of 25 per cent. The compound shall be free of ingredients known to the rubber trade as "oil substitutes."

8 per cent of the weight of new rubber used except as follows: if the manufacturer desires to use sulphur-bearing mineral fillers, thereby causing the total sulphur to be over 8 per cent of the weight of new rubber, he may do so, but shall submit for analysis a sample of the finished unvulcanized stock. Such stock shall not show a sulphur content in the acetone extract of over 8 per cent of the weight of new rubber used.

9. INSPECTION. The Motor Transport Service reserves the right to make any inspection, test, or analysis necessary to insure the product meeting all requirements of this specification.

10. PACKING. All tires shall be spirally wrapped according to standard practice and properly labelled on the outside showing size, type and name of manufacturer, and marked with either tag or label in colors of red, white or blue which will denote as follows: red, first four months of calendar year; white, second four months of calendar year; blue, last four months of calendar year; years to be designated by square, triangle and round labels or tags—tags or labels to be approximately 2 inches in diameter. Tires shipped for original equipment of cars shall be packed as specified by customer. In the case of oversea shipments, the specifications covering this shall be applied.

SPECIFICATIONS FOR PNEUMATIC AUTOMOBILE TIRE

CASINGS, SIZE 40 BY 8.

SPECIFICATION NO. 1072.

CORD CONSTRUCTION.

1. GENERAL. (a) Pneumatic automobile tire casings manufactured in accordance with this specification shall be of cord construction of the size known with the trade as 40 by 8.

(b) The tire must give satisfactory service under a load of 3,650 pounds, when inflated to 110 pounds per square inch.

(c) Tires to be free from all defects and fully guaranteed as to material and workmanship.

(d) Tires shall be of the standard commercial non-skid design of the manufacturer furnishing the same, or of rib tread design as specified on the order. In the case of a manufacturer using more than one non-skid tread design, selection of the design to be adopted is at the option of the Motor Transport Service. A small section of the tire shall be submitted for approval before contract is let.

(e) All tires shall be branded with the manufacturer's name, size of tires, serial number, and the tires shall be plainly marked with either tag or label in colors red, white or blue, which will denote as follows: red, first four months of calendar year; white, second four months of calendar year; blue, last four months of calendar year; years to be designated by square, triangle and round labels or tags—tags or labels to be approximately 2 inches in diameter.

(f) As soon as possible it is desired that all tires be marked with the

equivalent millimeter sizes as recommended by the Society of Automotive Engineers.

2. **TYPE.** All tires manufactured in accordance with this specification shall be of the straight side type, designed for the standard S. A. E. straight side rim of the size 37 by 7 inches or 40 by 8 inches.

3. **CONSTRUCTION.** (a) Carcase of tire shall consist of no less than four and no more than sixteen separate plies of cord applied in such a manner that an equal number of plies shall run in each diagonal direction across the tire.

(b) All cord material to be of the best quality combed Sea Island or Egyptian cotton or its physical equivalent.

(c) All cord fabric must be thoroughly dried according to standard manufacturing practice, before it is started through the operations of rubberizing.

(d) The usual methods of inspection used by tire companies in commercial practice to discover defects in each roll of cord fabric shall be employed, and tests to determine the tensile strength of cords shall be made on ten individual cords taken from each roll. These tests shall be made in the following manner:

The individual cords shall be tested in a fabric testing machine in which the distance between grips is approximately 10 inches, which grips separate at the rate of 20 inches per minute. The results shown must be up to the standard specification of the individual manufacturer.

(e) Beads shall be constructed with wire strands in the same manner as in standard commercial practice. Tensile strength tests for wire strands as used by the individual tire manufacturers in the construction of beads will be satisfactory in so far as they are sufficient to preclude any chance of a bead stretching or blowing off the rim when under pressure.

(f) Two chafing strips of fabric weighing not less than 12 ounces per square yard, shall be used. Each chafing strip must extend upward on each side of the tire, at least 2 inches from the heel of the bead. One chafing strip shall extend at least $\frac{1}{4}$ -inch above the other.

(g) There shall be a cushion of rubber compound applied over the cords which shall be wider than the breaker. The minimum gage of this cushion shall be .090-inch.

(h) Over the cushion there shall be at least one breaker strip of open-weave fabric, such as is used in standard commercial practice, coated on both sides with a rubber compound having the physical and chemical properties of a nature to form a perfect union between the cushion and tread when the cure is effected. This breaker strip shall have a minimum width of $\frac{1}{2}$ inches and shall be cut on a 45-degree bias. Breaker shall be made from the best quality Sea Island or Egyptian cotton or its physical equivalent, and shall not weigh less than 10 ounces per square yard.

(i) The tread of the tire shall not be less than $11\frac{1}{16}$ -inch thick, $\frac{1}{4}$ -inch of which shall be the minimum thickness for the part of the tread under the middle of the non-skid portion.

(j) The sidewall of the tire shall have a minimum thickness of $0\frac{625}{16}$ -inch.

4. **PHYSICAL MEASUREMENTS AND TESTS.** (a) Cross sectional diameter of each tire inflated according to the recommended weight and load schedule of the S. A. E. shall not be less than 8.25-inch.

(b) Tire shall be capable of withstanding water pressure of 350 pounds per square inch without apparent injury. This test to be made at the discretion of the inspector.

(c) The minimum strength of the tire shall be 4,000 pounds. This "strength factor" is the product of the number of cords per inch measured at the tread at right angles to the cords: times strength of individual cord as taken from the cord tire: times the number of plies.

(d) The strength of the union between breaker and tread and between breaker and cushion shall average 32 pounds or more per inch, using the standard friction test.

(e) Strength of the union between sidewall and plies shall average 14 pounds or more per inch, using the standard friction test.

(f) Strength of union between cushion and plies shall average 16 pounds or more per inch, using the standard friction test.

5. **ROAD TEST.** Any manufacturer bidding on orders for government business must be prepared to meet the following testing conditions:

(1) No tires are to be given consideration by the Government unless the company submitting the bid tenders an affidavit stating that they maintain and properly check up tests on cars to properly test their pneumatic tire product and that these cars deliver an average of 8,000 tire miles weekly.

(2) The cars, speeds, loads and road conditions must be such that the tires are properly tested and the Government may appoint an inspector to see that the above conditions are complied with.

(3) A successful bidder must supply an affidavit before delivering any tires to the Government stating that the tires to be delivered are practically duplicates in construction and material of tires which he has previously tested properly and a sufficient number of tires, satisfactory to the Motor Transport Service, at least six tires, have averaged on the rear wheels at least 5,000 miles.

6. **LINING.** The inside of each tire shall be properly lined in accordance with the standard practice of tire manufacturers.

7. **FLAPE.** A flap of the size 40 by 8 shall be furnished with each tire, in standard commercial practice.

8. **COMPOUNDS.** (a) The tread shall be made from and have the characteristics of a compound containing at least 70 per cent by volume of the best new rubber. Content of sulphur shall not exceed 8 per cent by weight of the new rubber used. Compound shall contain no reclaimed rubber. Minimum tensile strength of tread rubber shall be 2,700 pounds per square inch and shall have a minimum set of 25 per cent. Set tests shall be made by stretching 2 inches to 10 inches, and holding for 10 minutes. Rest sample for 10 minutes and then measure the per cent of elongation over the original length.

(b) Friction and Cushion.—These shall be made from and have the characteristics of a compound containing at least 85 per cent by volume of the best quality new wild or plantation rubber. Sulphur content shall not be more than 8 per cent by weight of new rubber used. No reclaimed rubber shall be used.

(c) Sidewall.—The sidewall shall be made from and have the characteristics of a compound containing a minimum of 65 per cent by volume of the best quality new wild or plantation rubber. Sulphur content shall not be more than 8 per cent of weight of new rubber used. No reclaimed rubber can be used. Compound shall have a minimum tensile strength of 1,800 pounds per square inch and a minimum elongation of 450 per cent (2 to 11 inches), and a maximum set of 25 per cent. The compound shall be free of ingredients known to the rubber trade as "oil substitutes."

(d) The total sulphur in any of the above compounds shall not exceed 8 per cent of the weight of new rubber used except as follows: if the manufacturer desires to use sulphur-bearing mineral fillers, thereby causing the total sulphur to be over 8 per cent of the weight of new rubber, he may do so, but shall submit for analysis a sample of the finished unvulcanized stock. Such stock shall not show a sulphur content in the acetone extract of over 8 per cent of the weight of new rubber used.

9. **INSPECTION.** The Motor Transport Service reserves the right to make any inspection test, or analysis necessary to insure the product meeting all requirements of this specification.

10. **PACKING.** All tires shall be spirally wrapped according to standard practice and properly labeled on the outside showing size, type, and name of manufacturer, and marked with either tag or label in colors of red, white or blue, which will denote as follows: red, first four months of calendar year; white, second four months of calendar year; blue, last four months of calendar year—years to be designated by square, triangle and round labels or tags—tags or labels to be approximately 2 inches in diameter. Tires shipped for original equipment of cars shall be packed as specified by customer. In the case of overseas shipments, the specifications covering this shall be applied.

SPECIFICATIONS FOR PNEUMATIC TIRE INNER TUBES.

SPECIFICATION NO. 1062.

1. **GENERAL.** This specification covers the following sizes:

(a) 26 by 3, 28 by 3, 29 by $3\frac{1}{2}$, 30 by $3\frac{1}{2}$, 33 by 4, 35 by 5, 36 by 6, 38 by 7, 40 by 8.

(b) All tubes manufactured to this specification shall be of the endless type except motorcycle tubes which shall be butt end or endless.

(c) All tubes shall be free from defects and guaranteed as to material and workmanship.

2. **COLOR.** The color of the tubes shall be left to the discretion of the manufacturer to use which has been generally used by the individual manufacturer with the best results in standard commercial practice.

3. **COMPOUND.** (a) Tubes shall be made from and have the characteristics of a compound containing a minimum of 90 per cent by volume of the best quality new wild or plantation *Hevea* rubber. Sulphur content shall not exceed 7 per cent by weight of new rubber used.

(b) The total organic acetone extract of the cured compound shall not exceed $\frac{4}{5}$ per cent by weight of the rubber used.

(c) The total sulphur shall not exceed 7 per cent of the weight of rubber used, except as follows: if the manufacturer desires to use sulphur bearing mineral fillers, thereby causing the total sulphur to be over 7 per cent of the weight of rubber, he may do so, but shall submit for analysis a sample of the finished unvulcanized stock. Such stock shall not show a sulphur content in the acetone extract of over 7 per cent of the weight of new rubber used.

(d) The filling material shall consist exclusively of dry mineral matter of which not more than 6 per cent of the total weight of the compound shall be calcium sulphate and in no case shall the calcium sulphate exceed 75 per cent of the weight of the antimony present, the total antimony being calculated to antimony pentasulphide.

4. **GAGES.** (a) Tubes shall fill the specifications in the following table for minimum curing pole size and minimum gages:

Size.	Minimum Pole Size.	Minimum Thickness.
26 by 3	$1\frac{1}{4}$ inches	.072
28 by 3	$1\frac{1}{4}$ inches	.072
29 by $3\frac{1}{2}$	2 inches	.080
30 by $3\frac{1}{2}$	$2\frac{1}{4}$ inches	.085
33 by 4	$2\frac{1}{4}$ inches	.095
35 by 5	3 inches	.125
36 by 6	$3\frac{1}{4}$ inches	.155
38 by 7	$4\frac{1}{4}$ inches	.175
40 by 8	$4\frac{1}{4}$ inches	.195

(b) In case tube is mold-cured measurements must be equivalent to above as determined by volume. If different-sized poles are used volume of rubber shall be at least equal to above measurements.

5. **SPICE.** The splice shall be as strong as the rest of the tube under inflation test.

6. **VALVES.** Each tube shall be fitted with one complete Schrader valve, or its equal, applied in such a manner as not to leak or tear out under ordinary usage. The following schedule shall apply:

26 by 3	Valves similar to Schrader's.....	No. 1936
28 by 3	Valves similar to Schrader's.....	No. 1936
29 by $3\frac{1}{2}$	Valves similar to Schrader's.....	No. 1936
30 by $3\frac{1}{2}$	Valves similar to Schrader's.....	No. 725 or No. 967
33 by 4	Valves similar to Schrader's.....	No. 725 or No. 967
35 by 5	Valves similar to Schrader's.....	No. 792
36 by 6	Valves similar to Schrader's.....	No. 2033
38 by 7	Valves similar to Schrader's.....	No. 2033
40 by 8	Valves similar to Schrader's.....	No. 2033

Each valve shall be fitted out with lock nut, rim nut, valve cap and valve. Dust cap shall be furnished for all valves with the exception of 26 by 3, 28 by $3\frac{1}{2}$, 36 by 6 and over. Spreaders shall be furnished for all sizes up to and including 35 by 5.

7. **MARKING.** These tubes shall be plainly marked with the manufacturer's name and size of tube, in both inch and the millimeter equivalent in accordance with S. A. E. standards.

8. **TESTS AND INSPECTION.** (a) Chemical and physical tests shall be made from each lot of one thousand tubes or less in order to secure deliveries of uniform quality and in accordance with the requirements of this specification. For physical tests cut from tube specimen in the form of the standard shape for rubber test samples. The center of the sample shall be $\frac{1}{4}$ -inch in width. The thickness shall be the full thickness of the tube and the length shall be 1-inch. The average of tests of five specimens cut longitudinally from each lot shall show a minimum elongation of 750 per cent (1 inch to $2\frac{1}{2}$ inches), and a permanent set of not more than 10 per cent. The per cent of permanent set will be determined by stretching test piece 500 per cent (1 inch to 6 inches) and holding at this point for 10 minutes followed by 10 minutes' rest and then measuring the per cent of elongation of test piece over the original 1-inch length. This percentage shall be called the per cent of permanent set of the specimen. Minimum tensile strength of tubes shall be 1,600 pounds per square inch.

(b) Each tube shall be tested for leaks by inflating with air and immersing in water.

(c) The Motor Transport Service reserves the right to make any inspection test, or analysis necessary to insure the product meeting all requirements of the specification.

9. **PACKING.** All tubes shall be wrapped and packed in an adequate pasteboard carton, such as is usually used by the manufacturer producing the tubes. The boxes shall be plainly marked with the manufacturer's name and the size of the tube and marked with either tag or label in colors of red, white or blue, which will denote as follows: red, first four months of calendar year; white, second four months of calendar year; blue, last four months of calendar year. Years to be designated by square, triangle and round labels or tags. Tags or labels to be approximately 2 inches in diameter.



RUBBER ASSOCIATION GOLF TOURNAMENT

RUBBER ASSOCIATION PLAYS GOLF FOR THE SOLDIERS.

THE Second Annual Gulf Tournament of the Rubber Association of America, held September 25, at the Trenton County Club, Trenton, New Jersey, was an unqualified success. The surplus receipts over and above the actual expenses of the tournament will be distributed equally between the American Red Cross, Knights of Columbus and Y. M. C. A. war relief funds.

J. A. Lambert, John S. Broughton, A. Boyd Cornell and L. P. Destribats met the visitors at the station and automobiles were waiting to carry them to the country club where they were cordially received by other members of the Trenton Rubber Manufacturers' Association.

The Tournament (eighteen holes medal play) in competition for the trophy cup—won by Trenton last year—, was managed by Horace T. Cook, J. Cornell Murray and Harold F. Blanchard. Fifty dollars in War Savings Stamps

was donated by the Rubber Association of America as prizes for the best gross and net scores. The following were the competing teams:

NEW YORK.

	GROSS.	HDC.	NET.
E. M. Brunn	97	18	79
E. J. Coughlin	97	14	83
A. E. Betteridge	91	5	86
C. W. Harrison	101	15	86
H. H. Cummings	101	15	86
J. H. Thomas	95	9	86
J. Lehman	100	14	86

THE WEST.

	GROSS.	HDC.	NET.
J. W. Herron	85	4	81
J. W. Thomas	93	11	82
Thomas Clements	97	12	85
L. E. Adams	100	13	87

NEW ENGLAND.

	GROSS.	HDC.	NET.
T. A. Ashley	88	6	82
C. L. Campbell	91	6	85
G. F. Hall	100	14	86
T. F. Kimball	106	15	91

TRENTON.

	GROSS.	HDC.	NET.
J. C. Murray	91	7	84
H. J. Cook	85	0	85
A. B. Cornell	101	12	89
C. C. Stokes	101	12	89
L. P. Destribats	103	14	89

W. J. Kelly presided at the dinner and announced the following winners: New York won the trophy with 334 for the four

best net scores; the West was second with 335; New England, third with 344, and Trenton, fourth with 347. Eighty-five, the first best gross score, was won by J. W. Herron who received \$15 in War Savings Stamps. The second best gross was T. A. Ashley's score of 88 and he received \$10 in stamps. First best net was won by E. M. Brunn with 79 and the prize was \$15 in stamps. John W. Thomas won the second best net with a score of 82, receiving \$10 worth of stamps.

The only speaker of the evening, ex-Governor Stokes of New Jersey, then addressed the audience which was amused and thrilled by the wit and patriotic logic of this popular after-dinner orator. In conclusion a vote of thanks was extended to the Trenton Rubber Manufacturers' Association as well as to the Outing Committee of the Rubber Association of America, comprising W. J. Kelly, chairman *pro tem.*, L. P. MacMichael, A. A. Garthwaite, and H. S. Vorhis, secretary,

for their united efforts that made possible this most enjoyable outing of patriotic rubber men on a day's vacation.

Among the Akron manufacturers present were Harvey S. Firestone and C. W. McLaughlin. A. D. Thornton of Montreal represented the Canadian manufacturers.

PERUVIAN LONG-STAPLE COTTON.

According to recent reports, there is at present a demand for American cotton gins and cotton baling machinery in Iquitos, the distributing point for goods for the whole of eastern Peru.

It appears that unusual interest has been aroused in the production of cotton and that the acreage is being extended. An excellent grade of cotton is raised from Sea Island seed imported from the United States. All of this cotton has an extraordinarily long staple, while the fiber is very silky, and compares favorably with the best Sea Island and Egyptian cotton. So far, all the cotton raised has been shipped to Liverpool, but producers are considering exportation to the United States as well.

CUSTOMS APPRAISER'S DECISIONS.

GUTTA SIAK.—Gutta Siak, classified under paragraph 502, Tariff Act of 1913, is crude gutta percha and should be admitted free of duty, on the protest of L. Littlejohn & Co., New York City. (Treasury Decisions, Vol. 35, No. 11, September 12, 1918.)

Annual Meeting of the Rubber Section of the American Chemical Society.

THE annual meeting of the rubber section of the American Chemical Society was held in Cleveland, September 11-12, at the Hotel Statler. Dr. L. E. Weber, chairman of the section, was prevented by illness from being present, and in his absence George Oenslager, of The B. F. Goodrich Co., a member of the executive committee of the rubber section, was selected to preside. The program as announced in the September number of THE INDIA RUBBER WORLD, was then taken up.

THE DETERMINATION OF LAMPBLACK.

A. H. Smith, of the Bureau of Standards, presented a very interesting description of the work they are doing on the determination of free carbon in rubber goods. The principal use of this method is to check the quality of the tires offered to the Government for war purposes, but the method has much wider applications. The essential point of this method is the complete removal by means of appropriate solvents and concentrated nitric acid, of all substances which would change weight on ignition, excepting the lampblack itself. The residue is then heated, and the loss in weight represents the carbon. A small correction is necessary to provide for the errors of the determination. This paper was discussed by Messrs. Evans, Tuttle, and Oenslager. Mr. Evans stated that this method had been used for a short time at the laboratories of The B. F. Goodrich Co. and found sufficiently accurate for commercial work.

LABORATORY METHODS FOR DETERMINING THE DEGREE OF VULCANIZATION.

Mr. Cranor gave a very excellent discussion, showing the difference in vulcanization between two compounds, one containing litharge as accelerator, and the other an organic accelerator. In the latter case he pointed out that complete vulcanization was reached before the ratio of combined sulphur to rubber showed a vulcanization equal to that of litharge. From this he concluded that physical tests alone were unsatisfactory in determining the correct vulcanization, and were absolutely worthless in determining small changes in vulcanization. He advocated chemical methods for vulcanization control, using for this purpose the combined sulphur ratio. He claimed this was much more sensitive than physical methods, and, the standard once set, it was comparatively simple and accurate to follow up.

THE FRUIT-JAR RING SITUATION.

The discussion on fruit-jar rings was opened by Charles P. Fox, who presented a very vivid picture of the conditions as he found them in the course of his investigations. He advocated the use of several simple tests, such as folding test, pulling test, and the twisting test. By means of these, purchasers of small quantities can instantly tell whether or not they have a good jar ring.

Mr. Fox's discussion was followed by remarks from Messrs. Tuttle, McGregor, Brock, Brittain, Warner and Dannerth. Mr. Tuttle stated that it is well known that a tremendous loss occurred during the year 1917, owing to the preserving of fruit in jars sealed by poor jar rings. The Government is working on this subject, but it is a question as to the progress made. He urged that the rubber section take up this subject with the idea of starting a campaign of education and driving the poor jar rings off the market. Mr. McGregor said that he understood the Canadian Government is working along the same lines. Mr. Brittain called attention to the fact that in many cases jar lids do not fit well, and therefore do not permit the jar ring to function properly.

Mr. Warner called attention to the way in which fruit-jar rings are marketed, stating that it is exceptional for them to be sold under the brand, or trade-mark, of manufacturers. They are sold through jobbers, and the same ring appears on the market under a number of different brands. This makes it difficult to trace bad rings back to the maker.

As a result of the foregoing discussion, it was decided to form a committee to be appointed by the chairman, whose duty it shall be to see that the attention of the public is drawn to this matter by a campaign of education, and also to work with the manufacturers and jobbers to ascertain what can be done towards establishing and maintaining a standard of quality. The chairman appointed as this committee the following: L. J. Plumb, United States Rubber Reclaiming Co., Inc., New York City; Charles P. Fox, consulting chemist, Cleveland, Ohio; A. H. Smith, assistant chemist, Bureau of Standards, Washington, District of Columbia; George Oenslager, chief chemist, The B. F. Goodrich Co., Akron, Ohio; and a representative of the Boston Woven Hose and Rubber Co., Boston, Massachusetts, to be announced later.

VULCANIZATION OF RUBBER AT CONSTANT AND BY A SERIES OF INCREASING TEMPERATURES.

The paper by G. D. Kratz and Arthur H. Flower was complete substantiation of the conclusions reached by Mr. Cranor. Mr. Kratz covered the subject very thoroughly, and in such detail as to leave no room for argument. The paper will be published at an early date, and no doubt will be carefully studied by all who are interested in this subject.

THE POISONOUS NATURE OF SOME ACCELERATORS AND PRECAUTIONS REGARDING THEIR USE.

The report of the committee on organic accelerators was read by the secretary, in the absence of Dr. Earle, chairman of the committee. The report was adopted by the meeting, and the officers of the section were instructed to see that this report receives wide publicity. The Council of the American Chemical Society has approved this report for publication.

Discussion of this report, and that on the jar-ring situation, brought out the need of a committee to investigate the relation of the rubber industry to public health. This matter was referred to the chairman, with power to act.

REPORT OF THE EXECUTIVE COMMITTEE.

The executive committee report, in the absence of Dr. Weber, chairman, was read by the secretary, and was adopted. In this report Dr. Weber stated that he would be unable to continue as chairman of the rubber section, and had therefore presented his resignation to the president of the American Chemical Society.

It was announced that the rubber section has no authority to elect officers, but that its officers are appointed by the president of the Chemical Society. However, in accordance with a previous understanding between Mr. Tuttle and Dr. Parsons, the secretary of the Chemical Society, the meeting proceeded to the election of candidates for the offices of chairman and secretary. The president of the American Chemical Society in the past has always approved of the choice of the section. The election resulted in the nomination of the following: chairman, John B. Tuttle, Firestone Tire and Rubber Co., Akron, Ohio; secretary, Arnold H. Smith, Bureau of Standards, Washington, District of Columbia.

A meeting was held September 12, to discuss informally the subjects which had been brought up the previous day, and to discuss plans for the coming year. At this meeting it was decided that it would be advantageous to prepare standard methods

for making physical tests and the chairman was instructed to appoint a committee for this purpose.

The attendance at Wednesday's meeting was about eighty, and would have been greater had the room been larger.

Among those present were the following:

John R. MacGregor, Eagle-Picher Lead Co., Chicago, Illinois.
L. J. Plumb, United States Rubber Reclaiming Co., New York City.
Frederick Danner, Newark, New Jersey.
R. T. Stokes, Sears, Roebuck & Co., Chicago, Illinois.
G. D. Kratz, Falls Rubber Co., Akron, Ohio.
Cole Coolidge, Falls Rubber Co., Cuyahoga Falls, Ohio.
Arthur H. Flower, Falls Rubber Co., Cuyahoga Falls, Ohio.
Charles P. Fox, Municipal Laboratories, Dayton, Ohio.
W. D. Pardoe, Thermoid Rubber Co., Trenton, New Jersey.
Walter H. Juve, The B. F. Goodrich Co., Akron, Ohio.
Frank P. Brock, Redmanol Chemical Products Co., Chicago, Illinois.
D. F. Cranor, Conshohocken, Pennsylvania.
A. H. Smith, Bureau of Standards, Washington, District of Columbia.
W. H. Hayt, Eagle-Picher Lead Co., Chicago, Illinois.
Geo. P. Loomis, The B. F. Goodrich Co., Akron, Ohio.
V. A. Cosler, The B. F. Goodrich Co., Akron, Ohio.
W. L. Smith, The B. F. Goodrich Co., Akron, Ohio.
Charles M. Knight, Akron, Ohio.
M. M. Harrison, Miller Rubber Co., Akron, Ohio.
R. J. Bonstein, Kelly-Springfield Tire Co., Akron, Ohio.
C. F. Devine, Habirshaw Electric Cable Co., Yonkers, New York.
John Young, Firestone Tire & Rubber Co., Akron, Ohio.
J. B. Britton, Firestone Tire & Rubber Co., Akron, Ohio.
E. W. Oldham, Firestone Tire & Rubber Co., Akron, Ohio.
A. B. Merrill, The B. F. Goodrich Co., Akron, Ohio.
C. W. Kohler, The B. F. Goodrich Co., Akron, Ohio.
P. R. Monahan, Rubber Insulated Metals Corp., Plainfield, New Jersey.
E. H. Grafton, Manhattan Rubber Manufacturing Co., Passaic, New Jersey.
E. R. Waite, The Goodyear Tire & Rubber Co., Akron, Ohio.
H. G. Pushee, General Tire & Rubber Co., Akron, Ohio.
C. A. Norris, Mechanical Rubber Co., Cleveland, Ohio.
A. C. Peterjohn, Mechanical Rubber Co., Cleveland, Ohio.
H. M. Koelliker, Mechanical Rubber Co., Cleveland, Ohio.
J. D. Morron, Mechanical Rubber Co., Cleveland, Ohio.
W. H. Cope, Lee Tire & Rubber Co., Conshohocken, Pennsylvania.
W. W. Evans, The B. F. Goodrich Co., Akron, Ohio.
Herman H. Lowenstein, Chemical Warfare Service, Nashville, Tenn.
L. J. D. Healy, Federal Rubber Co., Milwaukee, Wisconsin.
Lieut. Roscoe M. Gage, The B. F. Goodrich Co., Akron, Ohio.
G. Lloyd Allison, The B. F. Goodrich Co., Akron, Ohio.
G. C. Ashman, Bradley Polytechnic Institute, Peoria, Illinois.
Helen C. Gillette, Prest-O-Lite Co., Indianapolis, Indiana.
Zenzo Kenishi, Osaka Shosen Kaisha, New York City.
C. W. Hewlett, Kokomo Rubber Co., Kokomo, Indiana.
B. A. Allison, Parber Asphalt Paving Co., Madison, Illinois.
W. S. Kimley, Hewitt Rubber Co., Buffalo, New York.
H. A. Hoffman, The B. F. Goodrich Co., Akron, Ohio.
P. H. Henkel, Continental Rubber Works, Erie, Pennsylvania.
W. Scott, The Goodyear Tire & Rubber Co., Akron, Ohio.
W. J. Kelly, The Goodyear Tire & Rubber Co., Akron, Ohio.
T. Kimishima, Imperial University of Japan, New York City.
J. H. Link, Faultless Rubber Co., Ashland, Ohio.
R. L. Sibley, The Goodyear Tire & Rubber Co., Akron, Ohio.
M. M. Kahn, Kelly-Springfield Tire Co., Akron, Ohio.
A. H. Peterson, Kelly-Springfield Tire Co., Akron, Ohio.
H. F. Simmons, University of Akron, Akron, Ohio.
C. W. Sanderson, The Fisk Rubber Co., Chicopee Falls, Massachusetts.
E. G. Marshall, Fort Madison, Iowa.
G. S. J. Dalton, Mansfield Tire & Rubber Co., Mansfield, Ohio.
K. J. Thompson, Columbian Tire & Rubber Co., Columbian, Ohio.
George Oenslager, The B. F. Goodrich Co., Akron, Ohio.
John B. Tuttle, The Firestone Tire & Rubber Co., Akron, Ohio.

THE FOURTH NATIONAL EXPOSITION OF CHEMICAL INDUSTRIES.

THE Fourth National Exposition of Chemical Industries was held in the Grand Central Palace, New York, the week of September 23. Over 350 exhibitors participated and their displays covered three floors. Practically all of these exhibits had a bearing on the production of war material. The opening address of Dr. Charles H. Herty, chairman of the exposition's advisory committee, outlined the growth of the industry, showing its present position statistically, as regards exports in a few lines only, and indicating the possibilities for the future, and the invaluable aid the young dyestuff industry is rendering in the production of toxic materials for war purposes.

The daily program included symposiums on chemical topics and the exhibition of a large variety of moving pictures, changed each day, and covering a wide range of chemical and metallurgical manufactures and waterpower development.

Among the many instructive exhibits, those in the following list had special interest for the rubber manufacturer:

BARBER ASPHALT PAVING Co., Philadelphia, Pennsylvania, manufacturers of asphaltic products, among them Genasco brand mineral rubber.

THE BRISTOL Co., Waterbury, Connecticut, whose recording

thermometers and pressure gages are in use in practically every rubber mill. The output of this company includes their well-known recording instruments for temperature and time, with special fittings to adapt them to meet the requirements in rubber work; also new strip-chart type recorders and the Bristol patented safety set-screw. The total output of the latter is devoted to United States Government needs.

BUFFALO FOUNDRY AND MACHINE Co., Buffalo, New York, occupied a very large area in which was shown a line of heavy machinery such as vacuum dryers of commercial and laboratory size for rubber and other work.

J. H. DAY Co., New York City, exhibited their line of mixers with tight-fitting covers to conserve solvents, all of which find use in rubber mills where much cement is prepared.

J. P. DEVINE Co., Buffalo, New York, exhibited a few representative pieces of apparatus, which included a commercial size vacuum dryer and one for laboratory use. They also had on view a water still and a particularly heavy autoclave with mixing attachment.

HARRISON WORKS, Philadelphia, Pennsylvania. Extensive lines of paints and colors formed a portion of the extremely interesting and varied exhibition by E. I. du Pont de Nemours & Co. Zinc oxide, litharge and various other compounding ingredients of special purity and fineness for rubber makers' use were to be seen.

HUNTER DRY KILN Co., Indianapolis, Indiana, showed a model front end of their kiln, featured for the drying of rubber and equipped with direct reading hydrometer. The results of the Hunter system of drying as exhibited in samples of crude rubber were extremely interesting. The process has advanced in favor very rapidly since its introduction to the rubber trade, and is now in use in practically fifty American rubber factories.

DR. FREDERICK MAYWALD, F. C. S., New York City, featured his analytic and rubber experimental laboratory in a series of photographic views, and in an informing circular set forth particularly the needs of the small manufacturer for chemical service.

NEW JERSEY ZINC Co., New York City. There is probably no rubber manufactory in America where the product of this company is unknown. Their exhibit set forth their products in an effective and interesting manner.

SCHAFFER AND BUDENBERG MANUFACTURING Co., Brooklyn, New York, made an interesting display of pressure gages, thermometers and recording instruments adapted to every manufacturing need in such particulars.

F. J. STOKES MACHINE Co., Philadelphia, Pennsylvania, exhibited chemical machinery, rotary vacuum disks, and solvent recovery apparatus of interest in drying compounds, scrap rubber, etc.

WERNER & PFLEIDERER Co., Saginaw, Michigan, exhibited their complete line of mixers for rubber and other work in neat laboratory sizes very convenient for examination and demonstration.

EXPORTS FROM BRITISH GUIANA.

From January 1, 1918, to May 30, 1918, the exports of balata amounted to 234,514 pounds, against 432,251 pounds for the same period last year—a considerable decrease, therefore. Figures for rubber exports over corresponding periods show an increase for the current year and are 5,831 and 4,935 pounds, respectively.

HONDURAS RUBBER EXPORTS.

During 1917, crude rubber to the amount of 35,156 pounds, value \$15,086, was invoiced at the United States consulate at Cuba and the agencies at Bonaca, Roatan, and Tela. The 1916 shipments to the United States from the same districts totaled 54,347 pounds, value \$33,004.

What the Rubber Chemists Are Doing.

STANDARD PLANTATION RUBBER.

A RESUME of the results of the investigation of Eaton and Grantham on the variability of plantation rubber has been published in the "Journal of the Society of Chemical Industry," by M. Barrowcliff, F. I. C., supplemented by a discussion of the M. C. T. process of coagulation. Details of this process will be found in THE INDIA RUBBER WORLD of April 1, 1918. The principal features of this paper are quoted below.

The reason for the obvious partiality shown by the manufacturer for Pará is that plantation rubber, even of the highest grades, varies in quality, the variations being considerably greater than those found in different samples of fine hard Pará. Much experimental work, dealing with the causes of this variability has been published, notably by B. J. Eaton and J. Grantham. It was found that it is almost solely in respect of the time of heating required to ensure correct vulcanization, that is, to afford a vulcanized rubber having the best mechanical properties, that the variations occur. Samples of plantation rubber, prepared by the different methods in general use, were found to require for the correct "cure" widely varying times of heating, at a constant temperature. Further, rubber made by the same process, on different estates, and at different times on the same estate, was found to vary greatly in this respect. When, however, the proper time of heating had been found and applied, relatively small differences were noted in the mechanical properties possessed by the vulcanized samples.

The fundamental fact established by Eaton and Grantham is that the same factor for correct vulcanization varies inversely according to the degree in which the rubber coagulum has been allowed to remain, subject to coagulation, unworked, and in contact with its serum. The longer this period the shorter the length of heating required to produce a correct cure.

Bearing this in mind, also the fact that the present custom is to machine the rubber on the day following coagulation, the influences exerted by the various factors introduced, in practice, into the manufacture of rubber from latex can be accurately foretold. The greater the extent to which the coagulum is machined, and the more completely the serum is consequently washed out, the slower the rate of "cure" of the rubber produced. This "crêpe" rubber, as now marketed, is the slowest to vulcanize. "Sheet" rubber, which receives a much less drastic machining and retains a considerable quantity of serum that drains out relatively slowly, cures in a much shorter time. "Slab," which receives no mechanical treatment, and in which 12 to 15 per cent of the moisture is allowed permanently to remain, vulcanizes still more quickly.

In the preparation of "smoked" rubber two variables are concerned: (a) the action of the smoke products; (b) the temperature of drying. The former retards the rate of cure, while the latter, within the limits attained in practice, accelerates it. Hence, "smoked" sheet may cure either faster or slower than similar smoked sheet, depending on the balance of these factors in the earlier stages of drying.

In the case of unsmoked rubber, the rate of drying similarly affects the vulcanization time factor. The same plantation drying-room may produce on different days, according to the temperature and atmospheric humidity, rubber having different rates of "cure," even if the moisture content of the wet rubber happens on each occasion to be the same.

The amount of serum left in "sheet" rubber depends on the machining it has been given. Eaton found that the more concentrated the latex, the more rapid is the rate of cure of the "sheet" afforded by it. The coagulum from the undiluted latex being thicker and harder, more serum is retained in it after the

"rolling" process; the rate of drying, consequently is slower than in the case of the thinner sheet afforded by the diluted latex, affecting in the way expected, the optimum time required for the "cure." Similarly, "differential" rolls and rolls of equal size and speed will produce sheet rubber requiring differing times of "cure," other factors being constant. The effect of employing acetic acid to coagulate the latex is to retard markedly the rate of cure. Little difference is occasioned, however, between acid-coagulated rubbers by variations in the amount of acid that has been used, within the limits met with in practice.

As is obvious from the foregoing, to produce a uniform rubber without some radical change in method would involve almost insuperable difficulties. One type of rubber only could be permitted. The way out of this difficulty is clearly indicated by Eaton and Grantham's further work.

It was found that the change which takes place in the rubber coagulum and causes the diminution in the time of heating required for vulcanization is completed in the course of a few days. Although the maximum effect appears to be attained about the seventh day, there is little change in the rate of vulcanization after three days, when the vulcanized rubber possesses the best mechanical properties. The slower progress of the changes in the coagulum, as compared with the slab is probably due to putrefactive changes having occurred. To obtain the best results the coagulum should be left unworked for three days. It is then immaterial to what extent the rubber is worked, in what form it is finished, or how quickly or slowly it is dried, the time of "cure" not being affected to any significant extent.

If, however, coagulation is carried out in the usual way with acetic acid in open vessels the rubber coagulum undergoes changes if kept such a length of time, which render the method unsuitable. Putrefactive action sets in, accompanied by darkening of the coagulum, while spot diseases which have been shown to cause an extraordinary retardation of "cure" are likely to develop during the subsequent treatment.

A new procedure is required, therefore, and seems to be furnished by the method introduced by M. Maude and W. S. Crosse, known as the M. C. T. process. It is based on the fact that in closed vessels latex coagulates completely without the addition of acid and without at the same time undergoing putrefactive changes. As now carried out in practice, large cement tanks provided with heavy water-sealed covers are used. These are filled with the bulked latex, leaving the smallest possible air space. The covers are affixed and sealed and left undisturbed until the following day, when the coagulation is found to be complete. The resulting coagulum is converted into "crêpe" in the usual manner.

Addition may be made to each 100 gallons of latex of a quantity of a soluble calcium salt, namely, calcium acetate or sulphate (gypsum), corresponding to four ounces of calcium. The effect of this is to accelerate the coagulation. A beneficial effect on the properties of the rubber may also be produced. In this connection the fact should be noted that whereas the soils of the Amazon region are well supplied with lime, those of the Malay peninsula are remarkably deficient in this respect. Further, the Pará method of coagulation favors the retention of calcium compounds in the rubber, while acid coagulation tends to remove them. These points may be not without bearing on the causes of such differences as may exist between Pará and plantation rubber.

Regarding his comprehensive series of tests of crêpe, unsmoked sheet, smoked sheet, and slab rubber made by the M. C. T. process, B. J. Eaton states: "All the samples possess excellent tensile properties, equal to the best samples of plantation sheet and

crêpe, and prove that the process is capable of producing rubber of excellent quality."

Eaton's tests show the remarkable uniformity of the sample of crêpe rubber, considering that they represent the produce of old and young trees; of pure latex and latex diluted with water, and of rubber made on different days. The rate of cure was found to be more rapid than in the case of the standard sample of crêpe, a result attributed by Eaton to the absence of acid.

The figures given by Eaton show that this method of coagulation affords, at least, rubber equal in all respects to the best now being produced by acid coagulation and of greater uniformity. The point upon which stress requires to be laid, however, is that it is a process, and seemingly the only practical one, by which the coagulum may be allowed to mature for the length of time essential for eliminating the differences that otherwise result from unstandardized subsequent treatment.

For the production of "standard" rubber the bulked latex from a day's tapping requires to be placed in the coagulating tanks, as described above, and allowed to remain undisturbed for a fixed time, which it is suggested, should be three days. Under these conditions no putrefaction occurs and the coagulum remains perfectly white, except for a slight surface darkening.

Judging by the considerations advanced above, the rubber so produced, whatever the source, or whether finished as crêpe or sheet, would show no variations in the time of heating required under standard conditions for correct cure, while the vulcanized material would possess the maximum attainable textile strength. The cure would be substantially quicker than that of Pará under similar conditions, but this is an advantage, as it enables the manufacturer, while heating for the same length of time, to vulcanize at a lower temperature, which is all to the benefit of the finished material.

The result of the general adoption of the above described method of operation would be the production of a plantation raw rubber as uniform in its vulcanizing properties as fine hard Pará, and one affording at least as equally satisfactory product.

CHEMICAL PATENTS.

THE UNITED STATES.

PROCESS OF MAKING A SUBSTITUTE FOR WHITING.—A product known as artificial whiting manufactured by processes similar to those employed in the conversion of natural chalk into whiting, precipitated chalk, or other forms of calcium carbonate. With such artificial whiting, either during or after its manufacture, an organic salt or soap is incorporated. The whiting if neutral is made to contain free alkali or lime and an organic derivative is added which will convert the free alkali or lime into a salt or soap. Such addition may consist of oleic acid, tannic acid, benzoic acid, or any of the higher organic fatty acids, or a phenol, such as carbolic acid, or alpha or beta naphthol. (Herman B. Kipper, Solvay, New York. United States patent No. 1,264,392.)

VULCANIZATION OF RUBBER.—A method of accelerating a vulcanizing process which consists in adding to the rubber mixing an accelerator comprising caustic alkali dissolved in a hydroxy-organic compound forming a solvent which is not decomposed by the alkali. The solvent specified is glycerol or glycol. (Douglas Frank Twiss, Sutton, Coldfield, England, assignor to The Dunlop Rubber Co., Limited, Westminster, London. United States patent No. 1,271,810.)

PROCESS OF VULCANIZING RUBBER SHOES.—The articles are heated by the application of a heating medium applied to one side while maintaining the opposite side free from contact with a condensable heating medium, and when the article has been sufficiently heated to prevent condensation thereon, then subjecting the opposite side to a condensable heating medium at a vulcanizing temperature. (Charles E. Bradley, assignor to Mishawaka Woolen Manufacturing Co., both of Mishawaka, Indiana. United States patent No. 1,271,843.)

LABORATORY APPARATUS. FILTERING TUBE.

THE apparatus shown was designed particularly for handling those precipitates whose solubilities necessitate great economy with the liquid used for transferring and washing.

A straight glass tube, having a stop cock at its middle point, is sealed to a carbon filter tube. The latter is fitted with a two-hole rubber stopper. The stem of a Walter crucible - holder passes through one hole of the stopper while the other contains a right-angled exit tube. The connection leading to the suction pump is intercepted by an ordinary T-tube, the free end of which is joined to a short piece of rubber tubing as an air inlet.

In operation, the perforated crucible G with prepared asbestos felt, is set in collar W. Once adjusted, the suction needs no interruption throughout the filtration. When cock S and clamp M are closed, the tube C serves as a small filter flask. When Clamp M is opened and pushed past the shoulder onto the tube T, atmospheric pressure is restored within the apparatus; then on opening cock S, portions of the filtrate can be delivered into the original beaker. ("Journal of Industrial and Engineering Chemistry," by permission Chemical Director, E. I. du Pont de Nemours & Co.)

DYNAMOMETER.

The illustration shows the type of dynamometer used in the so-called "barbecue" test for determining the adhesion of soft rubber to hard in solid truck-tires. It consists of a calibrated elliptical spring which flattens under the strain applied to the end loops, thus imparting motion to the indicating mechanism in the rear of the dial. The instruments have an extra pointer which is loose and which remains at maximum strain after load is released. Capacities vary from 500 to 5,000 pounds. (John Chatillon & Sons, New York.)

FISH SCALE RUBBER.

The "Scientific American" devotes much space to the success an inventor has attained in compounding fish scales and rubber. According to the tale, the compound vulcanizes and forms a tougher product than has previously been discovered. It is a thousand to one that fish scales as a compounding ingredient are no better than hundreds of other ingredients already in use. The fact is, anything dry can be incorporated with rubber, and the mass vulcanized. The test is what sort of a plastic, if any, can be produced from fish scales without rubber. If alone, they do not sheet and show resilience, the resilience found in the rubber and fish scale combination comes from the rubber and from nothing else.

When you buy War Savings Stamps you do not give—
you receive.

The Allocation of Sulphur.

PRIOR to the taking over of sulphur by the United States Government, William G. Woolfolk, Commodity Chief, War Industries Board, asked The Chemical Alliance, Inc., a body representing the entire chemical industry, to furnish a concrete plan covering the allocation of brimstone, pyrites and coal brasses.

At a special meeting the directors of The Chemical Alliance, Inc., affirmed their desire to handle the allocation of sulphur materials and appointed a Committee on Production, Distribution and Control of Sulphur Materials to work out the details of the plan to serve Mr. Woolfolk in an advisory capacity in carrying out the authority conferred upon him by the War Industries Board. The committee consists of three directors of the Alliance, as follows: A. D. Ledoux, chairman; W. D. Huntington, and C. G. Wilson.

In order that the trade may be advised of the proper method of procedure to get sulphur-bearing materials, the following statement has been issued by The Chemical Alliance, Inc.:

Because of the shortage of pyrites, due to the curtailment of Spanish ore, made necessary for the conservation of shipping, the War Industries Board has for months past been giving serious consideration to the question as to the best method of dealing with the important subject of sulphur materials.

The Chemical Alliance, Inc., being a body representing the entire fertilizer and chemical industries, and very closely associated in an advisory capacity with all government departments interested in the promotion of chemical manufacture and agriculture, was asked by the War Industries Board to furnish a concrete plan for handling sulphur materials.

It will be noted that the War Industries Board has taken full control of all sulphur materials by the following resolution:—

Due to the increased demand by the Government for sulphur, in the manufacture of explosives and for other purposes, and to the increasing burdens on the rail and water transportation systems, control of the production and distribution of sulphur materials has become necessary to insure, as far as possible, an adequate supply to the Government and an equitable distribution of the surplus to other users; therefore be it

Resolved, That the War Industries Board will assume control of sulphur materials, and hereby authorizes Mr. William G. Woolfolk, commodity chief in charge of pyrites and sulphur, to act for the board in controlling the production and distribution of sulphur materials, availing of such voluntary assistance as he may see fit of individuals or committees representing the producers and users of sulphur materials, and, in case any producer or consumer declines to abide by the decision of the War Industries Board, commanding orders will be issued where necessary.

It is the duty of the committee to obtain from producers and consumers such information as thought necessary to enable satisfactory control, which extends to all imported as well as domestic sulphur materials. The committee's work will be materially lightened if all producers and consumers will furnish the information which may be asked for without loss of time, and meet the situation in the same patriotic manner as they are now doing in other matters.

Inquiries, including the matter of sale or purchase of sulphur materials, should be addressed to the Committee on Production, Distribution and Control of Sulphur Materials of The Chemical Alliance, Inc., at either room 135, Interior Building, Washington, District of Columbia, or 15 William street, New York City.

The work of this committee is now well under way. Detailed information is being acquired regarding the production or consumption of all firms concerned, stocks on hand, amounts needed, transportation facilities and increased production problems, and the committee is rapidly placing itself in a position to allocate material and assist industries using sulphur materials while still making certain that the government war program shall not suffer. Allocation will be by agreement as nearly as possible, since it is the desire to depend

largely on the cooperation and patriotic spirit of those concerned. It is only when an improper spirit is shown that drastic action may be necessary.

The chairman, A. D. Ledoux, states that such alarming articles as have recently appeared in the daily press regarding an alleged sulphur shortage are misleading and unfortunate. There is no shortage in the sense that the material is giving out, but it is difficult to obtain under present conditions of transportation and labor. We have hardly begun on the great brimstone deposits of Louisiana and Texas; numerous producers of pyrites east of the Mississippi will furnish a large supply in the aggregate, and there are heavy deposits of pyrrhotite to be resorted to if necessary. The problem is largely a matter of allocation of our supplies and transportation, essential uses naturally being given first consideration. Very large stocks of sulphur, Mr. Ledoux asserts, are already mined, and from the present outlook the rubber trade need have no uneasiness in regard to its supplies.

All users of sulphur, however, should realize that while the present outlook shows a sufficient supply for our essentials, it should not be wasted, and an earnest effort should be made to conserve its use to the greatest possible extent. As in the case of crude rubber, steel, sugar, and all basic materials, we are expected to do our utmost to produce, utilize and conserve the materials which are nearest available and so assist the transportation problem by rail and water, which after all is the real difficulty, and thereby facilitate increasing the flow of troops and supplies to France. It is not logical to haul material a thousand miles where there is other material close by the manufacturer's plant. It is not right that one firm should pile up heavy stocks to last for many months while another firm not far off is suffering because of inadequate stocks. In such an instance, a producer would be expected to ship his material to the one who needed it, and the manufacturer having the large stocks would be expected to stop receiving more until matters were evened up. It is along these general lines that the committee intends to work, and both Mr. Ledoux and Mr. Woolfolk are the sort of men who can be relied on to exercise their authority fairly and wisely in keeping industries running.

UNDEVELOPED SULPHUR DEPOSITS.

In response to the editorial and article on the sulphur situation in THE INDIA RUBBER WORLD of August 1, 1918, the following letter has been received:

As the writer is in touch with the owners of certain sulphur deposits, would it be possible for you to give me the names of corporations seeking independent sulphur supplies for their own needs, as referred to in the last paragraph of your editorial? Or, any other means you might suggest whereby we could place the sulphur deposits to the benefit of the industry.

SULPHUR CAN BE SAVED IN RECLAIMING SCRAP RUBBER.

In a recent letter to the Editor, a prominent chemist of the Middle West expresses himself as follows:

In the August issue of your valuable paper you refer to the restriction on the use of sulphur and seem to make light of it, as research and science have proved that it can be replaced. It is all right to keep on smiling, even if you hear some unpleasant news. But the fact will not be changed that the place of sulphur will not be taken by any other substance—at least for the duration of this war. All that we can do is to save sulphur, use it more economically and not waste it.

In giving out the slogan, "Don't waste sulphur," I am thinking of the enormous amounts of sulphur in scrap rubber which are destroyed by the reclaiming process. This sulphur can be saved in numerous cases, and a very high-grade reclaimed is obtained. You were referring to this process in THE INDIA RUBBER WORLD about eight months ago.

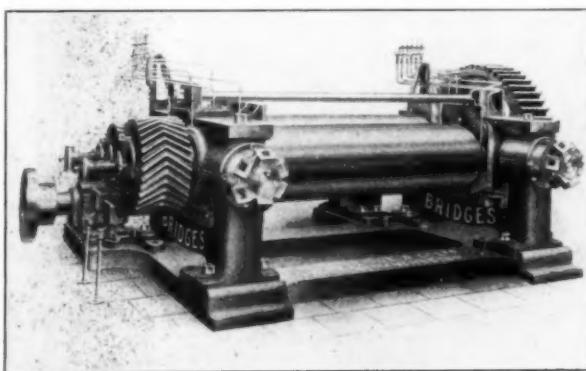
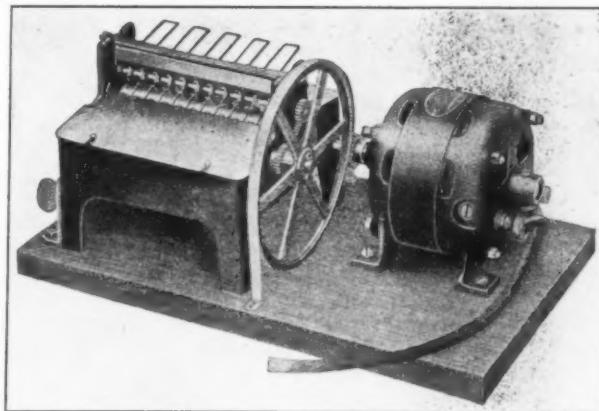
New Machines and Appliances.

ENGLISH TYPE SINGLE-GEARED MIXER.

SEVERAL novel features in heavy mill construction are embodied in the single-gear mixer shown in the accompanying illustration. The rolls, 22 inches front and 26 inches back, by 84 inches wide, are of chilled cast iron, the working faces being ground and polished. The necks of the rolls are 16 inches in diameter and journaled in heavy boxes, lined with the best phosphor bronze. Sight-feed lubricators supply oil to the bearings and large steam inlets and outlets of an improved type are provided. The massive cast-iron side-frames that support the rolls are fitted with strong steel caps and the frames are bolted to a heavy cast-iron bed plate, six inches deep. The rubber compound guides are of an improved adjustable type, provided with a steel stay-bar that takes up the thrust on the guides during milling operations. The roll-adjusting screws are of large diameter with square threads and equipped with capstan heads for large roll-adjusting bars. The cast-iron safety nuts are designed to fracture when the strain on the machine is excessive.

The main driving-gear, which is a cast-iron machine-cut spur-gear with 14-inch face and $3\frac{1}{2}$ -inch circular pitch, is keyed to the back roll and driven by a machine-cut steel pinion on the floor-shaft and operated by a dog or claw-clutch. The

These machines are furnished with motor-drive in three sizes, operated by direct or alternating current or by hand, No. 1 taking labels up to five inches wide, No. 2 up to eight



pinion can be made to slide on the shaft if two or more mills are arranged on one line. The front roll is driven from the back roll and the herring-bone gears are cast-steel, machine-molded with long teeth to allow for roll adjustment. They are 14 inches wide and three-inch circular pitch. (David Bridge & Co., Limited, Castleton, Manchester, England.)

UNIVERSAL LABEL-PASTING MACHINES.

These machines afford a quick and efficient means for applying paste to labels or, in fact, to any surface, thereby doing away with the unsanitary paste pot and brush. One type of machine is designed to apply paste to the edges of surfaces, and another is used to moisten gummed labels up to 5 inches in width. This machine is also adapted for moistening stamps where large quantities are used.

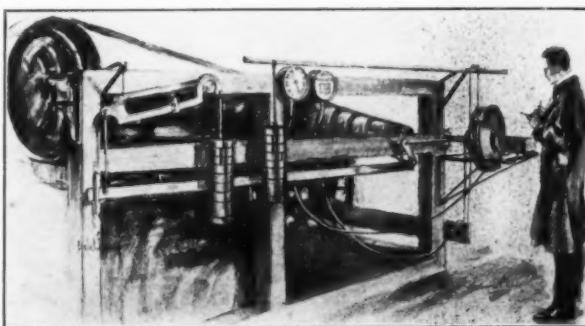
The operation is quite simple and requires only ordinary intelligence to produce satisfactory work in quantity. All that is required is to remove the front cover, fill the paste box about one-half full, and replace the cover. The label is then laid on the front plate and fed between the rolls that are operated by a motor-drive, or by hand power if so desired. The amount of paste is regulated by adjusting the feed-roll scraper located in the paste box.

inches wide, and No. 3 up to twelve inches wide. The No. 4 machine applies paste to the edge of a sheet or wrapper over a space from $\frac{1}{8}$ -inch to $3\frac{1}{2}$ inches wide. The No. 5 machine is used for applying water to gummed labels or stamps and the No. 6 machine is an improved model with the same dimensions as machine No. 1. (A. G. Prior, 665-671 Broad street, Newark, New Jersey.)

BRAKE-LINING TESTING MACHINE.

The production of brake lining has become a firmly established branch of the rubber industry and manufacturers are supplying the automobile trade and makers of machinery requiring clutch facings with a material that will withstand severe usage under varying conditions.

A special testing machine that has been designed to determine the wearing resistance of brake linings, subjects the material to a wearing pressure of 50 pounds to the square inch for a period of 20 hours, and at a temperature of 212 degrees. The percentage of wear shown in this test indicates the heat-resisting quality of the fabric and the absence of combustible material in the



brake linings. Furthermore, the machine is arranged so that the lining can be subjected to any pressure and immersed in oil or water, or covered with dirt, and by a system of weights it is possible to determine exactly the amount of pressure required to bring a car of any weight to rest in any space. (Standard Woven Fabric Co., Walpole, Massachusetts.)



HYDRO AIR-COMPRESSOR FOR INFLATING TIRES.

The possibility of oil being carried into rubber tires with the air when a power driven air-compressor is used, may be obviated by the use of a compressor operated by water pressure. The standard garage air-compressor here shown will deliver clean air at any desired pressure, no reducing valve or other device being used. The makers claim that the standard compressor will deliver 40 cubic feet of free air per hour at 105 pounds up to 110 pounds, at water pressure of 75 pounds; 35 cubic feet with 65 pounds of water; 30 cubic feet with 56 pounds of water; 27 cubic feet of free air with 50 pounds of water. All air pressure same as first named. (The Dunn Hydro Co., Denver, Colorado.)

AERO AUTOMATIC FIRE ALARM SYSTEM.

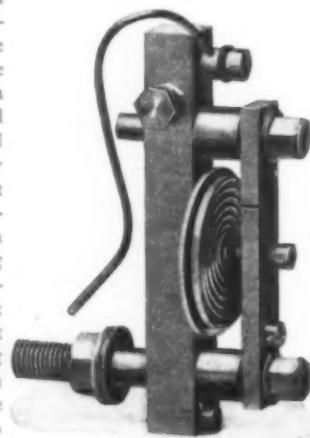
This system is built on the principle that air expands with the application of heat. In applying this principle, loops of fine copper tubing, spaced twenty feet apart, are affixed to the ceiling of the factory or warehouse. These loops vary in length with a maximum of one thousand feet according to the local conditions. The loop, or aero circuit, terminates at both ends in a flexible silver diaphragm. Expansion of the air in the tubing bulges the diaphragm outwards and makes an electric contact with a fixed-point contact screw. The making of this contact closes an electric circuit, causing the bells and other signals to operate effectively.

Whenever there is a variation in the temperature of the atmosphere the pressure in the aero tubing correspondingly fluctuates. The pressure increases with the increased temperature and decreases with the decreased temperature. To prevent unnecessary alarms an instrument called a "compensating leak valve" is inserted between the diaphragm and the aero circuit. Its function is to allow the pressure in the tubing to equalize that of the air outside the tubing until actual fire conditions exist.

The alarm bells do not ring, except under fire conditions, because a pressure sufficient to affect the diaphragm and to make an electric contact cannot be attained until the growing pressure in the tubing exceeds the equalizing capacity of the leak valve. Herein lies the value of the system; it is sensitive to fires at their inception, sounding the alarm when the fire can be extinguished with the fire buckets and plant extinguishers. Each fire area has its own distinctive code signal. (Aero Alarm Co., 26 Cortlandt street, New York City.)

CAST HIGH-SPEED STEEL BY NEW PROCESS.

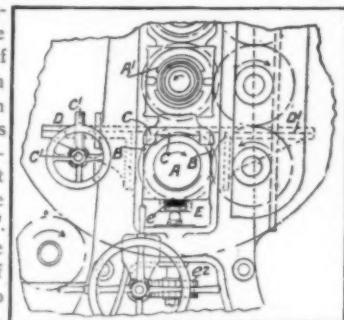
The Cutler-Hammer Manufacturing Co., Milwaukee, Wisconsin, has recently built a new foundry, 50 by 75 feet, in which to manufacture high-speed steel which is made by blast firing by a special process and then cast. This is one of the first attempts to cast high-speed steel. The foundry has a maximum capacity of 1,000 pounds daily.



MACHINERY PATENTS.

CALENDER ADAPTED FOR FILLING MOLDS.

MOLDS are filled with rubber or similar composition by passing them between the bottom rolls *A* and *A'* of a three-roll calender. The bearing-blocks *B* of the roll *A* are adjustable by means of eccentrics *c* mounted upon shafts adjustable by worm gearing *c'*, *C'*. The blocks *B* are mounted upon supports *E* having resilient pads *e* of rubber that are adjustable by gearing *e'*. Tables *D* and *D'* for the feeding and delivery of the molds are attached to the bearings *B*; or conveyors may be used. (A. F. Hawkins, Spring Bank, Hough Lane, Leyland, Lancashire, England. British patent No. 116,787.)



OTHER MACHINERY PATENTS.

THE UNITED STATES.

No. 1,274,073. Device for shaping and vulcanizing automobile-tire patches. A. L. Murray, assignor to The Double Fabric Tire Co.—all of Auburn, Ind.

1,274,465. Machine for inserting cross-wires in solid tires. W. C. Stevens, assignor to Firestone Tire & Rubber Co.—all of Akron, O.

1,275,491. Collapsible tire-core. C. Stein, Akron, O.

1,275,858. Tire core. V. L. Cox, assignor of one-half to A. Schonenberger —both of Akron, O.

1,275,072. Tube-wrapping machine. J. G. Moony, Erie, Pa.

1,275,794. Tire-building machine with revolvable core. J. D. Thomson, assignor to The Goodyear Tire & Rubber Co.—all of Akron, O.

THE DOMINION OF CANADA.

184,498. Sectional core for making inner tubes. The Mercer Tire Co., assignee of H. Dech—both of Trenton, N. J., U. S. A.

184,563. Tire-wrapping machine. O. E. Heckman, Akron, O., U. S. A.

THE UNITED KINGDOM.

116,774. Means for collapsing tire cores. Wood-Milne, Limited, Ribble Bank Mills, Preston, and W. Ford, Meadow street, Leyland, Lancashire.

117,005. Mixing machine for plastic substances. J. E. Pointon and Perkins Engineers, Limited, Westwood Works, Peterborough.

117,097. Machine for extruding plastic rubber, etc., in pipe or other form. J. Stratton, The Lindens, Winton Road, Rowdon, and E. A. Claremont, Broom Cottage, High Legh—both in Cheshire.

THE FRENCH REPUBLIC.

486,595. Apparatus for vulcanizing. A. Robert, A. Dessauly, and A. Barlier.

PROCESS PATENTS.

THE UNITED STATES.

No. 1,274,496. Tire-casing manufacture. R. J. Arens, assignor to The Goodyear Tire & Rubber Co.—both of Akron, O.

THE UNITED KINGDOM.

116,674. Method of manufacturing seamless rubber hot-water bottles. G. Cain, 16 Whitford Gardens, and Mitcham Rubber Co., Morden Road—both in Mitcham, Surrey.

A NEW DIVIDED DEMOUNTABLE RIM.

A divided demountable rim is the invention of Joseph Stungo, of Edinburgh, Scotland, who has spent practically a life-time in the tire and rubber business. It is most simple in construction and requires no special wheels, as it will fit any wheel made for a detachable rim. All that is necessary with this rim is to open four hooks on the inside, which may be done with the fingers, and one-half of the rim lifts off, leaving the casing exposed for the removal of the inner tube. The repair being made, the half-rim is replaced and the hooks slipped over the pins, when the rim is ready for service. It can be easily adjusted by an inexperienced person without the use of tools. The rim is owned by the American Rim, Tire & Rubber Co., Pittsburgh, Pennsylvania, a Delaware corporation.

The Editor's Book Table.

COTTON AND OTHER VEGETABLE FIBRES: THEIR PRODUCTION and Utilization. By Ernest Goulding, D.Sc., F.I.C., with a preface by Wyndham R. Dunstan, C.M.G., LL.D., F.R.S. John Murray, London, England. (Cloth, 8vo, 231 pages, illustrated. Price, 6 shillings, net.)

THIS volume of the Imperial Institute Handbooks to the Commercial Resources of the Tropics consists primarily of an exhaustive study of cotton as the most important of vegetable fibers. Sections are devoted to a description of the cotton plant; an account of the structure and composition of the fiber; methods of cultivation with details of the cultural systems adopted in the United States and Egypt, diseases and pests, and the preparation of cotton for the market. Particulars are given as to the production and varieties of cotton in the chief cotton-growing countries of the world, including the United States, Egypt, India, Peru, Brazil, Mexico, Asiatic Russia, China, Japan, and various British colonies, together with statistics of trade and market prices.

THE PHILIPPINE JOURNAL OF SCIENCE, CONTENTS AND INDEX, volume I (1906) to volume X (1915). Bureau of Science, Department of Agriculture and Natural Resources, Manila, Philippine Islands. (Paper covers, 7½ by 10½ inches, 442 pages. Issued free to subscribers having volumes XI and XII of "The Philippine Journal of Science"; price to others, \$2 United States currency.)

This comprehensive list of contents and index to the first ten volumes of "The Philippine Journal of Science" has been in preparation since 1915 and consequently purports to be complete in its inclusion of everything which has been published in the "Journal," together with correction of errors and omissions from the yearly indices. The book contains the table of contents, and author and subject indices, so that any article can be readily located.

REPORT OF THE CEYLON CHAMBER OF COMMERCE (INCORPORATED) for the year ended 31st December, 1917. (Paper cover, 247 pages, charts, tables.)

A preliminary survey of trade in general, freight and important legislation, is followed by a more detailed report of business in the chief commodities imported and exported, rubber being included among the latter. Tables of imports and exports, average prices obtained for Ceylon products and a chart showing the weekly rise and fall in the prices and quantities of rubber of all grades offered at local auctions during 1917 amplify the statements in the report. Correspondence on important measures taken by the British and local governments cover, among other subjects, rubber export restrictions, the packing of rubber, and shipping regulations. Lists of members and of officers past and present, justices of the peace, holidays for the year 1918, arbitrators and surveyors, and the minutes of the general meeting, complete the volume.

A VALORIZAÇÃO DA BORRACHA E O PROCESSO DE COAGULAÇÃO "Cerqueira Pinto." Associação Commercial de Pará, Pará. (Paper cover, 29 pages.)

In view of the fact that the Brazilian Government is attempting to help the rubber industry, whose condition is causing much concern, by urging the adoption of the coagulating process known by the name of the inventor, Dr. Cerqueira Pinto, the Associação Commercial do Pará has addressed this pamphlet of protest to the Minister of Agriculture, Industry and Commerce.

The association points out that in spite of the fact that Dr. Pinto's method was first introduced in 1913, it has not succeeded at all in displacing the primitive process of coagulation in use. Investigations at that time showed that rubber prepared with Dr. Pinto's coagulant equalled plantation crêpe, but was inferior to smoked fine Pará. Various foreign authorities are quoted to show that the process of smoking, which

would be abandoned where the "Cerqueira Pinto" preparation was employed, is in fact responsible for the superior quality of Pará rubber. Consequently, the association is of opinion that so far from discouraging coagulation by smoking in favor of the proposed chemical preparation, the Government should aim at improving the existing method by promoting the use of simple and cheap machinery to facilitate the labor of the *seringueiro* and at the same time to protect his health.

TECHNISCHE ANALYSEN. BY DR. IR. H. I. WATERMAN. TECH-nische Boekhandel G. van Herwinnen, Dordrecht, Netherlands. (Paper cover, 36 pages, diagrams.)

This little book is intended as a manual for practical exercises in the chemical laboratory, and discusses a dozen different subjects, among which may be mentioned the examination of lubricating oils, heat of combustion of solids, liquids, and gases; examination of white of lead, ultramarine, lithopone, zinc white, ochre, water, and copper sulphate.

NEW TRADE PUBLICATIONS.

THE MORSE CHAIN CO., ITHACA, NEW YORK, HAS RECENTLY published a booklet of data sheets containing useful information regarding silent chain drives. It is illustrated with cuts of engines and drives, covering the subject of the number of teeth and links, lubricating and venting, sprocket materials, chain widths, chain contacts, chain adjustments, etc. It will be sent free on request.

"THE RUBBER LEAF" IS A 24-PAGE MONTHLY PUBLISHED BY THE employes of the McGraw Tire & Rubber Co., East Palestine, Ohio. It is ably edited by W. E. Palmer, and contains, aside from breezy personal mention, much good humor and helpful suggestion.

THE STENOGRAPHIC REPORT OF THE PROCEEDINGS AT THE luncheon given by The Rubber Association of America, Inc., for the War Service Committee of the Rubber Industry of the U. S. A., July 31, 1918, at the Waldorf Astoria, New York City, has been published as a permanent record in pamphlet form by the Association.

"NUMBER FORTY," AN ILLUSTRATED MONTHLY NEWSPAPER FOR druggists, published by the Faultless Rubber Co., Ashland, Ohio, has made its first appearance, dated September. While featuring "Wearever" sundries, it aims to present rubber news and sales methods of interest and value to the drug trade.

"HOW TO INCREASE TIRE MILEAGE," IS THE TITLE OF AN ATTRACTIVE ILLUSTRATED PAMPHLET OF 64 PAGES WHICH HAS BEEN ISSUED FOR DISTRIBUTION AMONG ITS PATRONS BY THE FIRESTONE TIRE & RUBBER CO., AKRON, OHIO. RESPONDING TO THE URGENT NECESSITY OF THE TIMES TO MAKE PNEUMATIC TIRES PERFORM THEIR UTMOST SERVICE, THIS LITTLE HANDBOOK TELLS IN DETAIL BY WORD AND PICTURE HOW TO SELECT THE RIGHT TIRES AND TUBES, HOW TO USE, CARE FOR AND REPAIR THEM, AND SHOWS THE RESULT OF NEGLECT IN EACH INSTANCE.

"THE DUTCH EAST INDIAN ARCHIPELAGO" IS A MONTHLY COMMERCIAL PUBLICATION RECENTLY STARTED IN JAVA AND PRINTED IN ENGLISH. J. VEERSEMA, BATAVIA, IS THE EDITOR, AND A. A. VAN DER KOLK, BUITENZORG, IS THE PUBLISHER.

THE AIM OF THE JOURNAL IS TO PRESENT TO ENTERPRISING FOREIGNERS ALL POSSIBLE INFORMATION REGARDING THE DUTCH COLONIES, WITH THE IDEA OF PROMOTING NEW RELATIONS BETWEEN THESE PARTS AND THE REST OF THE WORLD.

Interesting Letters From Our Readers.

ONE HUNDRED THOUSAND ACRES OF RABBIT BUSH.

TO THE EDITOR OF THE INDIA RUBBER WORLD:

DEAR SIR:—In your article, "The United States Can Produce Its Own Rubber," reprinted in part by the "Literary Digest," you refer to getting rubber from rabbit bush. I am sending you a sample to test and advise me if it contains much rubber, as I know of 100,000 acres of rabbit bush. This place I refer to consists of 165,000 acres, but I allow 65,000 acres as likely to be clear or covered with other bushes. This bush grows at an elevation of 4,000 to 5,000 feet and stands between four and six feet in height. The sample is between five and six feet. Does the strong odor have anything to do with the rubber? There is water to be had if necessary. Can you give me the name of a rubber company to which I may write? Will you to be so kind as to forward to some interested company the sample of rabbit bush which I am sending to you?

Thanking you for your attention, I remain,

Very respectfully,

MRS. FLORENCE E. DAVIS.

Los Angeles, California.

MORE REGARDING AMERICAN-GROWN RUBBER.

TO THE EDITOR OF THE INDIA RUBBER WORLD:

DEAR SIR:—The interesting article, "The United States can Produce its own Rubber," in the June issue of THE INDIA RUBBER WORLD, unlocks some valuable information concerning the possibilities of another source for the production of crude rubber in Northern America.

The article and the editorial comment emphasize a vital need; and they go far towards lifting the veil of uncertainty that has clouded the horizon of a new and needed industry.

Waiving the claims of guayule and pingué as being the most valuable native plants for the purpose indicated, and assuming that their value as economical producers of crude rubber is entirely too dependent upon the influence of irrigation on the quality and quantity of the caoutchouc, we can take up a discussion of the Hall-Goodspeed discoveries and add a few words of confirmation.

The two plants mentioned, the giant rabbit bush, (*Chrysanthemus*) and the dwarf rabbit bush, (*Ericameria*)—belong to the great *Compositae* family, and are relatives of the guayule (*Parthenium*) and pingué (*Actinella*). Both of the new plants contain rubber and allied compounds. In certain qualities they both excel the latter plants. The natural growth of both the guayule and pingué is limited by local factors of altitude, moisture and wind. Both of these new sources of crude rubber, especially the giant rabbit bush, have a much wider range of territory, altitude and soil selection. The giant rabbit bush is a foot-hill or mountain plant which selects dry rocky places along or in the beds of dry gullies. It is not very abundant. The dwarf rabbit bush is an inhabitant of the plains, is very abundant, and can be readily propagated. A most valuable characteristic of this plant is its ability to thrive on alkali flats. It is also drought-resisting to a marked degree.

We grant without discussion the claims for these plants concerning their abundance, range or territory, and suitability for cultivation under the most adverse conditions. As to their value as producers of rubber of a grade better than or even equal to that of guayule, I am not so confident. Of the two plants, the quality of the giant rabbit bush product seems to be a shade better. The product from the dwarf rabbit bush is inferior, being tacky; but the yield is larger and there is also a valuable resin and essential oil.

However, the soft character of this rubber may have been caused by a depolymerization due to storage of the dry plant previous to extraction. Under these conditions such a change takes place in guayule. In the matter of priority of discovery of rubber in these plants, there will exist a doubt.

The smaller bush is known as "grease wood" on account of its burning qualities, and the stain made upon dry soil by an exudation from the plant. From a description of the plant, the writer is inclined to the opinion that it is the same plant worked by Werner and Ellis, who obtained a patent covering their process and product in 1902. In 1903, while investigating the Colorado rubber weed (pingué), the writer had both of these plants under observation. Laboratory results, obtained from samples of these plants from southern Colorado, balanced against yield and nat-

ural supply, and other economic factors, were not of sufficient importance to warrant a venture in their direction. About 1905, a sample of the dwarf rabbit bush was forwarded to the Diamond Rubber Co., Akron, Ohio, from Silver Creek, Colorado. This sample also contained a small amount of rubber, much resin and an essential oil. The resin would be of value in frictions and the essential oil useful in scenting soap. The resin being of the saponifiable type, it can be made directly into a natural-scented soap. As these oils are usually highly antiseptic, such a soap may have considerable medicinal value.

At the request of Mr. Pearson, of THE INDIA RUBBER WORLD, I prepared a few notes concerning "Possible Rubber Producers in the Temperate Zone." This paper was read at the Third International Rubber Conference, New York, 1912, and published in THE INDIA RUBBER WORLD, June 1, 1913. Under the name "Strobel's Rubber Plant" (named in recognition of the collector), mention is made of a shrub now identified by means of the excellent photographs reproduced in THE RUBBER WORLD as the dwarf rabbit bush.

I am glad that the California Section of the National Council of Defense, through the University of California, has taken hold of the matter. I am again glad to know that the work is being carried out by Professors Hall and Goodspeed. During the past decade Professor Hall has aided me in identifying and obtaining interesting plants in my search for rubber producers. With the aid of THE INDIA RUBBER WORLD, I am certain that the goal is in sight.

Yours sincerely,

CHARLES P. FOX.

Cleveland, Ohio.

THE RUBBER FACTORY IN SCHOOL TEXTBOOKS.

TO THE EDITOR OF THE INDIA RUBBER WORLD:

DEAR SIR:—It has recently come to my attention that a section of your article on "Vocations" anent india rubber, which appeared in volume IV of the Young Folks' Library, published by Hall & Locke Co., Boston, has been given a new title, "In the Factory," and incorporated in the Riverside Seventh Reader, published by the Houghton Mifflin Co., Boston.

Rarely is the work of a writer for the technical or trade press classed as literature and accorded a place in book form beside selections from such gifted pens as those of Longfellow, Bryant, Stevenson, Holmes, Thomas Bailey Aldrich, and John Burroughs. May I not congratulate you on this well-merited distinction?

Sincerely yours,

MADISON R. PHILLIPS.

CANADIAN SOLDIER BECOMES RUBBER COMPOUNDER.

TO THE EDITOR OF THE INDIA RUBBER WORLD:

DEAR SIR:—At present I am employed in the chemical department of a rubber factory in this city and am desirous of becoming thoroughly familiar with general compounding for the rubber trade. If there are any books I can procure on compounding I would be much obliged for the names of them. I might say I have had only a few months at the compounding end of the game, having taken it up on being discharged from the Canadian Army as unfit for further service through wounds. I spent twenty-two months in France, and had the pleasure of teaching some of the boys from the U. S. A. the system as used in the Allied Armies. I was a first lieutenant.

Very truly yours,

C. H. STANYON.

Toronto, Canada.

AUTOMOBILE SHOWS CANCELED.

The national automobile shows to have been held in New York and Chicago have been canceled at the request of the War Industries Board and promoters throughout the country have been asked to abandon all plans for local shows of automobiles, trucks, or accessories.

Become a stockholder in the United States—buy War Savings Stamps.

New Goods and Specialties.

THE "TRI-CO" RAIN RUBBER.

ARUBBER or wiper for wind shields, which attaches to the lower edge of the upper glass, cleans both upper and lower portions of the shield simultaneously. It slides across easily by means of a slot provided for the purpose and may be operated by either the driver or passenger in the automobile.



Some point of diversity, however, entitles their inventors to a patent. (Tri-Continental Corp., Sidway Building, Buffalo, N. Y.)

FAIRFIELD RUG ANCHOR.

You may now safely decorate your highly polished hard-wood floors with the most slippery of antique rugs you can afford, yet with the long-wished-for assurance that you may step on them as nonchalantly as you please without danger. A new fabric called rug anchor, made of rubber-faced whipcord, is laid under the rug with the rubber-coated surface forming a non-skid one against the floor. Du Pont Fabrikoid Co., Inc., successor to Fairfield Rubber Co., Wilmington, Delaware.



A NOVEL HEEL DESIGN.

A new design for a rubber heel shows a conventionalized pattern with notched-in outer edge and the center portion form by a star having seven points of uneven length and the center cut out. This design has recently been patented. (Gustav A. Huben, 2219 Fremont street, Chicago, Illinois.)

SYPHON BATH OUTFIT FOR THE SOLDIER.

In addition to the rubber boots and coats, hand basins and drinking cups, inflatable pillows and mattresses, etc., now comes the portable siphon-bath outfit for the soldier, with the same convenient fittings to which he was accustomed at home, but compactly arranged in a folding khaki case provided with pockets and straps to hold all the different parts securely in small space. The case is sold packed in a neat carton. (Knickerbocker Manufacturing Co., 206-216 West Sigel street, Chicago, Illinois.)

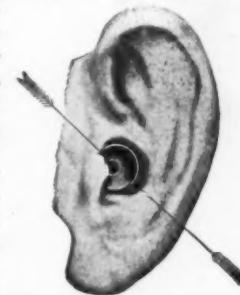


AN EAR STOPPLE FOR SWIMMERS.

A device to protect the ears of swimmers and bathers, divers, and marine divers from being flooded with water or irritated by particles of sand or other foreign substances, is shown in the accompanying illustrations. The smaller one illustrates the ear stopple itself and the larger gives an idea of how the stopple

looks in position in the ear. These ear stopples have no opening, yet permit the wearer to hear almost normally.

For other purposes, however, such as gunning and hunting, cycle racing, riveting and boiler-making, etc., another style called the perforated ear stopple, is recommended. Both designs are made of soft, flesh-colored rubber and are almost unnoticeable when in position. They are easily removed from the ears when desired, and weigh very little. (Dr. Frank Ear Stopple Co., 325 Locust street, Toledo, Ohio.)



FOR THE SOLDIER'S PROTECTION AND COMFORT.

For the protection of the soldier against rain and storm there are many types of garments and one of the practical ones is the military cape. That in the accompanying illustration is made in four styles of double-texture tan or olive-drab fabric in different qualities and weights, coated with tan, olive-drab, or black rubber, with sewed, cemented, and strapped seams. One style is reversible, and all are provided with large arm slits and ball-and-socket fasteners. These capes are 52 inches long and are

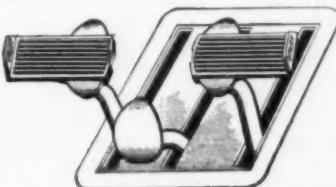


made to fit small, medium, and large-sized men.

The mattress above, known as the "Handy Camp Mattress," is covered with khaki cloth and is fitted with the "staytite" valve. It is strong, flexible, and easily adjusted according to the degree to which it is inflated. When not in use, the mattress can be rolled up into a small, compact bundle which is easily carried. (Hodgman Rubber Co., Tuckahoe, New York.)

UTILITY SURE-GRIP PEDALS.

A new style of pedal for use on Ford cars is called the "Utility Sure-Grip." It is faced with a good quality of rubber and is wide enough so that the foot does not readily slip from position. These pedals are also differentiated in shape so that there is a marked contrast between that for the reverse and those for the clutch and brake on either side. A nut holds each pedal in place. The material used is pressed steel with a non-rusting metal edge around the rubber facing. (The Hill Pump Valve Co., Archer avenue at Canal street, Chicago, Illinois.)



THE "FITSAL" FAUCET CONNECTOR.

A faucet connector which is provided interiorly with three grooves of varying diameter is known as the "Fitsal" because it fits faucets of one-quarter, five-eighths, or three-quarters-inch diameter (equivalent to three-eighths, one-half, or five-eighths-inch thread), as well as three-eighths and one-half-inch diameter standard tubing. This convenient connector is made of high-grade para rubber and is easily adjusted, as it needs no stretching. It is especially suited to use with bath sprays and portable showers. A chain is provided for looping over the faucet to guard against the attachment being blown off by water pressure. (The Bunker Hill Rubber Works, Bunker Hill, Illinois.)

**BULL'S EYE "RUB-R-SEALED" PATCH.**

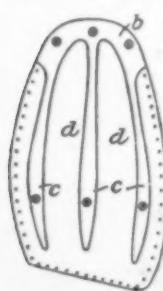
A patented patch for mending inner tubes is made of "Rub-R-Sealed" elastic fabric composed of cotton elastic webbing rubber-faced on both sides, one being fine Para rubber and the other, inner-tube stock. The unvulcanized patches are cloth-wrapped on and around a metal core and the cloth-wound ones are open-steam-vulcanized, producing a curved effect. (Bull's Eye Rubber Co., Inc., 131 Harris avenue, Long Island City, New York.)

THE "DREADNAUGHT" SAFETY SUIT.

The practice of conservation affects greatly differing lines of products, one of the latest of which is the safety suit of rubberized fabric. Our issue of November 1, 1915, described the Youngren life-saving suit, later called the "Ever-Warm." This included a large rubber-covered metal framework at the top, which was heavy and clumsy. The conservation of metal by the Government, to cite only one reason, led to the invention of an improved life-saving suit along similar lines, called the "Dreadnaught." The new suit does away with the metal frame and mittened hands. It is provided with an opening at the neck, by which it is put on, which closes by being folded over on itself watertightly and held in place with buckled straps. The sleeves end in elastic-fabric wrists which make them water-tight and leave the hands of the wearer free to operate wireless or do anything else desired. The feet are weighted to maintain the wearer in an upright position and the suit obtains its buoyancy from the kapok with which it is padded. An outside pocket holds food, etc. (Life-Preserver Suit Co., 1385 Broadway, New York City.)

**NEW ENGLISH SOLE.**

Owing to the scarcity of leather in England, a great variety of rubber or fiber-and-rubber soles have been produced. One of the latest is composed of a canvas backing having secured to it a rubber tip *b* and undercut or grooved ribs *c*, with a filling *d* of rubber substitute secured in place by vulcanization. The drawing shows how this sole-protector, which it really is, looks. It is said to be popular, as it does not slip, and it is fairly cheap. This sole is patented in The United Kingdom. (F. J. Wood, 3 Raws street, Bank Parade, Burnley, Lancashire, England.)

**THE "NO-THUMP" TUMBLER WASHER.**

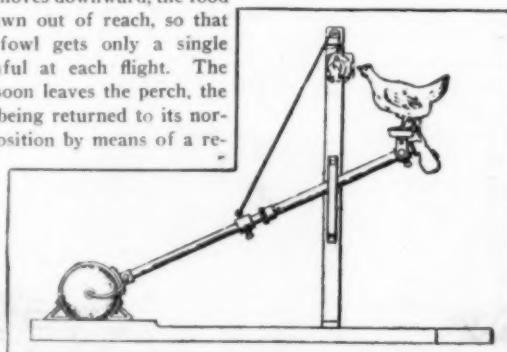
A patented device in general use at soda fountains which prevents the nicking and breaking of soda glasses during the washing process and which at the same time provides for adequate cleansing and sterilizing, is embodied in the "No-Trump" tumbler washer shown herewith. The bottom part of metal is provided with three pieces of rubber tubing which are replaceable and are held in position by means of little projections from the framework, so that no metal runs through the rubber tubing to make it unyielding when the glasses hit it. Other features of this practical piece of soda-fountain equipment provide for the washing of the inside and outside of the glass simultaneously with either hot or cold water or water to which a sterilizer has been added. The hand of the person holding the glass touches the bottom only, the glass being bottom upward. (L. L. Rowe, 74 Portland street, Boston, Massachusetts.)

**SUBMARINE "R 2."**

Among the latest war toys is a submarine which can be made to run submerged or on the surface of the water, straight ahead, or in circles. It will also dive, rise to the surface, and simultaneously shoot a projectile. All this is accomplished by adjustment of the vanes and rudders. This submarine is fifteen inches long. The hull is of wood, painted battleship-gray, and the operating parts are of brass, galvanized steel, and rubber. (The Wilkins Toy Co., Keene, New Hampshire.)

**FOWL-DISINFECTING AND EXERCISING APPARATUS.**

A novel use for the rubber bulb has been found in an ingenious device, not without its amusing features, for automatically spraying fowls with powdered or liquid disinfectant. When a fowl leaps upon the perch of the apparatus to reach the cabbage suspended by a cord over a pulley on the support above, the weight of the fowl moves the inclined hollow lever downward, compressing a large rubber bulb at the bottom with sufficient power to blow air through the lever and force the disinfectant from the reservoir of the nozzle onto the fowl, as indicated. As the lever moves downward, the food is drawn out of reach, so that each fowl gets only a single mouthful at each flight. The fowl soon leaves the perch, the lever being returned to its normal position by means of a re-



silient spring. Many fowls are thus induced to take exercise and submit to disinfection in their attempts to get the food. (David B. Bird, 7351 Coles avenue, Chicago, Illinois.)

News of the American Rubber Industry.

PENNSYLVANIA RUBBER CO. ANNUAL CONFERENCE.

THE annual conference of sales directors and branch managers of the Pennsylvania Rubber Co., Jeanette, Pennsylvania, was held at the factory of the company from September 18 to 21, the business sessions taking place, however, at the Wayfarers Club—the Pennsylvania Rubber Company Club, next to the factory. The meetings were conducted by H. W. DuPuy, president, and Seneca G. Lewis, general manager, while messages were read from the vice-president, Major C. M. Du Puy, and other members of the company now serving the Government. The artistic little booklet giving the program had as a center-spread a miniature service flag printed in the proper colors, bearing six stars, and under each appeared the name of the man it represented.

THE CUTLER-HAMMER COMPANY IN WASHINGTON.

The Cutler-Hammer Manufacturing Co., Milwaukee, Wisconsin, manufacturing electric-controlling devices and similar apparatus, opened on September 3, 1918, a branch office in the Union Trust Building, 15th and H streets, N. W., Washington, District of Columbia, in charge of H. W. Knowles and C. W. Yerger, engineers who are quite familiar with the company's products. This office will be operated entirely for the purpose of serving the Government and others who require information about the company's goods, orders, contracts, etc.

ASHLEY PLANT SUFFERS FIRE LOSS.

On the morning of September 26 the plant of T. C. Ashley & Co., manufacturers of chemicals and rubber substitutes, in the Brighton district of this city, was almost entirely destroyed by fire, with a loss variously estimated from \$15,000 to \$20,000.

It may be remembered that T. C. Ashley & Co.'s plant at South Boston was burned a year ago, and the firm moved from that location to Brighton.

GOODRICH NOTES.

The B. F. Goodrich Co., Akron, Ohio, is calling for 1,000 new women war workers in its gas-mask and balloon department. It assures good wages, daylight shifts, and wholesome factory conditions.

The list of former employees of The B. F. Goodrich Co. now in service numbers 3,356.

"The Goodrich Circle" printed in its September number a notice to employees in four languages besides English, advising American and foreign employees alike how to conduct themselves at work, urging them to guard against arguments, fire, waste, excessive indulgence in alcoholic drinks, and laziness, as well as the showing of consideration to foreigners—all in the interest of maximum production of what the country needs.

The B. F. Goodrich Co. started on September 9 a special class in citizenship, under the direct supervision of Dr. Oscar Junek. Foreign-born employees previously classed as enemy aliens, but who had taken out their first papers at least two years prior to the declaration of war on Germany by the United States were declared eligible for membership and to apply for final papers.

Following its policy of re-employing soldiers who return disabled by the war, The B. F. Goodrich Co. now has back in its tire-finishing department Jean Joseph Roignant, who has a limp, a Medaille Militaire, and a Croix de Guerre. He pays a high tribute to Americans in the war—"They fight like the French," he says, "to the death, and what they take they hold."

DIVIDENDS.

The American Chicle Co., New York City, declared its regular quarterly dividend of one and one-half per cent on its preferred stock, payable October 1 on stock of record September 20, 1918.

The Apsley Rubber Co., Hudson, Massachusetts, has declared its semi-annual dividend of three and one-half per cent on its common stock, payable October 1 to stock of record September 30, 1918.

The Canadian General Electric Co., Limited, Toronto, Ontario, Canada, has declared its regular quarterly dividend of two per cent on its common stock, payable October 1 to stock of record September 14, 1918.

E. I. du Pont de Nemours & Co., Wilmington, Delaware, declared the regular quarterly dividend of four and one-half per cent on the common stock, payable September 16 to stock of record August 31; also the regular quarterly dividend of one and one-half per cent on the debenture stock, payable October 25 to stock of record October 10, 1918.

The Hawkeye Tire and Rubber Co., Des Moines, Iowa, declared on August 1, the semi-annual dividend on its preferred stock and on August 19, a dividend of six per cent on its common stock, payable October 15, 1918.

The Kelly-Springfield Tire Co., New York City, has declared its quarterly dividend of \$1.50 per share on its six per cent preferred stock, payable October 1 to stock of record September 16, 1918.

The Keystone Tire and Rubber Co., New York City, has declared its quarterly dividend of two per cent and an additional one-third of one per cent on its preferred stock and its regular quarterly dividend of three per cent on its common stock, payable October 1 to stock of record September 20, 1918.

The Portage Rubber Co., Barberton, Ohio, has declared its regular quarterly dividends of three per cent and one and three-quarters per cent, respectively, on its common and preferred stock, the former payable November 15 on stock of record November 5, 1918, and the latter payable January 1, 1919, on stock of record December 20, 1918.

The Republic Rubber Co., Youngstown, Ohio, declared its quarterly dividend of one and three-quarters per cent on its preferred stock, payable September 1 to stock of record August 20, 1918.

The Sewell Cushion Wheel Co., Detroit, Michigan, recently declared a seven per cent cash dividend on both common and preferred stock.

TILLINGHAST COMPANY INCORPORATES.

The business of the late B. C. Tillinghast at 236 Market street, Philadelphia, Pennsylvania, has been incorporated as the B. C. Tillinghast Rubber Co., Inc., with capital of \$75,000 and the following officers: A. W. Tillinghast, president; J. H. Carr, vice-president and general manager; F. F. Crippen, secretary and treasurer. Besides these, the incorporators include Mrs. L. W. Tillinghast, James H. Beith, and Charles Hess, Jr.

The company was incorporated in accordance with the wish of Mr. B. C. Tillinghast, as expressed in his will, and the incorporators include his widow and son and the employees of the concern, of whom the latter have been in service for periods ranging from 22 to 38 years. These are to have the privilege of purchasing stock in the new company. Messrs. Carr, Beith, and Hess will continue to travel for the concern, in addition to their other duties. The company manufactures all kinds of rubber goods, including "Imperial" tires and tubes, clothing and footwear, mechanical rubber goods, and rubber toys.

CHARLES A. RICE.

THREE years ago the city of Youngstown, Ohio, suffered from a flood which put the municipal water supply service out of commission, the needs of the city for both fire protection and general use being supplied, in the emergency, by connecting the independent system of The Republic Rubber Co. with the city water mains until the subsidence of the flood allowed the pumping station to resume operations.

The history of this water supply is interesting. Four years ago The Republic Rubber Co. found it necessary to secure an independent water supply. Sufficient pressure and volume were

CHARLES A. RICE.

available, but the water was too warm and its mineral action was destructive to boilers, pumps, etc.

The problem was solved by Charles A. Rice, who was then, as now, in charge of the mechanical and electrical equipment of the plant. Two miles from the factory, in the hills, was an abandoned coal mine, at the bottom of which was a lake of clear, cold water. Mr. Rice devised a system of siphonage and pumping by which the water, brought to the surface, forms a brook for nearly half a mile, and then enters a 10-inch pipe, through which, by gravity, it supplies the factory constantly with pure spring water.

During his 15 years with the company, Mr. Rice has made many other important mechanical improvements at the plant, including the equipment of individual motor drives in the calender room, the installation of low-pressure turbines superseding high-pressure reciprocating engines, and the addition of coal and ash-handling equipments, centrifugal pumping machinery and other up-to-date improvements.

Mr. Rice was born in Deerfield, Ohio, in 1875, and supplemented a common-school education by a course in electrical engineering. In 1891 he became engineer in a flour mill, and two years later for a short time was in the electrical department of the Carnegie Steel Co. at the Ohio works; thence going to The Republic Rubber Co. as assistant electrician, becoming chief electrician in 1906, and in 1912 being given full charge of all mechanical and electrical equipment.

He is a member of the American Institute of Electrical Engineers, and of all the Masonic bodies, up to and including the thirty-second degree. His home is at Youngstown, Ohio.

NEW OFFICERS OF BOONE TIRE & RUBBER CO.

The Boone Tire & Rubber Co., Chippewa Falls, Wisconsin, at its annual meeting elected the following officers and directors for the ensuing year: I. V. Maclean, president; F. W. Edgell, vice-president; Holmes Ives, secretary; and J. M. Andrejeski, treasurer; directors—all the above and J. C. Clink, C. B. Culver, Charles F. Oashgar, W. W. Shong, and W. J. Fulton.



PERSONAL MENTION.

James K. Beach has been appointed supervisor of the Texas territory of the Ajax Rubber Co., Inc., New York City, and will have his headquarters at Dallas. He was previously the company's California supervisor, with headquarters in San Francisco. He succeeds H. C. Burnett who has entered government service.

J. B. Bleiler has been appointed special representative of the truck tire division of The Republic Rubber Corp., Youngstown, Ohio, with headquarters at 1745 Euclid avenue, Cleveland, Ohio.

George M. Hoffman holds a record of 15 years' service as manager for The Republic Rubber Co., Youngstown, Ohio, at its branch at 2020 Locust street, St. Louis, Missouri.

L. N. Bartlett has been appointed assistant manager for The Republic Rubber Co., Youngstown, Ohio, at its branch at St. Louis, Missouri.

H. D. Chipley is manager for the United States Tire Co., New York City, at its branch at 1311 East Main street, Richmond, Virginia, to which address it has recently removed. This branch is in the Philadelphia district of the company.

Ernest L. Patten, Malden, Massachusetts, has been granted a patent on his sole-cutting machine described in THE INDIA RUBBER WORLD of August 1, 1918.

Prescott C. Ritchie has succeeded H. S. Johnson, who recently resigned, as western district representative for the Westinghouse Electric & Manufacturing Co., East Pittsburgh, Pennsylvania, with headquarters at Indianapolis, Indiana. He was formerly in charge of headquarters inquiry work for the same company in its western district and main offices. Previous to that he was connected with the Thomas B. Jeffrey Co., Kenosha, Wisconsin.

William E. Barker, for some years manager of shoe sales of the United States Rubber Co., but who resigned from that position last summer, and later made a tour of inspection of the company's *Hevea* plantations in Sumatra, has been appointed general sales manager of the wire division of the National India Rubber Co., Bristol, Rhode Island, a subsidiary of the United States Rubber Co.

J. R. Hall, president of J. R. Hall & Co. and vice-president of the First National Bank of Flemington, New Jersey, has succeeded G. Frank Ginglen, resigned, as secretary of the Dural Rubber Corp. of that town.

H. M. Murdock formerly manager of the branch of the United States Tire Co. at Amarillo, Texas, has succeeded Frank Kathman as manager of the company's branch at 224 North Sixth avenue, Quincy, Illinois.

A. M. Hill has been appointed sales manager of The Fisk Co. of Texas, San Antonio, Texas.

G. H. Carnahan, of the International Rubber Co., West Barrington, Rhode Island, has been appointed vice-president of The Bayer Co., Inc., manufacturer of aniline colors and pharmaceutical products by the Alien Property Custodian, who recently took over The Bayer Co., and will sell its capital stock to American citizens as soon as the books have been audited and the property appraised.

Stuart Webster, formerly treasurer of the Racine Rubber Co., Racine, Wisconsin, and vice-president of the Ajax Rubber Co., Inc., has come East from Racine to act as treasurer of the Ajax company in New York City. He succeeds Harold Stimpson, who has resigned to enter government service.

Dr. E. A. Wullenweber has signed a contract for a term of years as chief chemist for The Mid-Continent Tire Manufacturing Co., Wichita, Kansas.

Miss Hazel McCarthy succeeds Miss Frances E. Silbaugh as nurse in charge of the first aid department at The Federal Rubber Co., Cudahy, Wisconsin, Miss Silbaugh being with the Red Cross in France.

TRADE NOTES.

The United States Rubber Co., New York City, announces that the net earnings of the company for the six months ended June 30, 1918, amounted to \$10,242,365.46 after deducting all interest charges and allowing for depreciation, federal taxes, and reserves.

The Pennsylvania Rubber Co., Jeannette, Pennsylvania, at its recent annual meeting elected the following officers: H. W. DuPuy, president (reelected); Charles M. DuPuy, vice-president; Seneca G. Lewis, general manager; and G. W. Shively, secretary.

The Burdick Tire & Rubber Co., 220 South State street, Chicago, Illinois, announces its removal to Noblesville, Indiana, where all mail should be addressed. Plans of this company for the building of a factory and other operations in Noblesville were mentioned in our issue of March 1, 1918.

The Zwebell Brothers Co., Milwaukee, Wisconsin, which has been engaged in the motor car sales and repair business for some years, has recently developed an improved method of dry cure retreading and will begin the manufacture of a mold for retreading tires. The company has incorporated at \$25,000 for this purpose.

The Neilson Rubber Co., 533 South Ervay street, Dallas, Texas, distributor of "Quaker" tires, is adding a two-story, 35-foot addition to its present building to take care of its increasing business. S. P. Neilson is manager of the company.

The Life Preserver Suit Co., Inc., has removed its offices from 11 to 1358 Broadway. It is now putting on the market a new improved life-saving suit made of rubberized fabric, described on another page of this issue.

The American Mineral Co., Johnson, Vermont, mining and milling talc, has completed installation of motors at its mill and is now operating with hydro-electric power supplied from the village of Morrisville over an eight-mile transmission line built especially for it. It uses approximately 225 horse-power twenty-two hours daily. It plans to extend this equipment to its mines, also.

The Whitestone Tire & Rubber Co., Inc., 1215 Fourth avenue, Seattle, Washington, has undertaken the distribution of Mason tires and tubes for that state. Maurice Kline is president of the concern.

The Motor Equipment Co. of America has changed its name to the Wheel and Rim Works Corp. The office of the corporation is with the United States Corporation Co., 311 South State street, Dover, Delaware.

The Southland Tire & Rubber Co., Fort Worth, Texas, is completing its new factory, which is of fireproof construction, 80 by 300 feet, four stories high. Modern machinery and equipment has been purchased and most of it delivered ready for installation. In the meantime the company is turning out its product in another plant on its own cores, molds, etc., under the supervision of its superintendent of production. The officers of the company are: William Ginnuth, president; J. C. Verner, vice-president; and C. M. Zeigle, secretary. W. H. Verner is the fiscal agent of the concern.

The Cleveland Tire & Rubber Co., formerly at 309 North 15th street, Philadelphia, Pennsylvania, has removed to 685 North Broad street and changed its name to the Gillette Tire Co. of Philadelphia. J. W. Paul is general manager.

The Lion Tire & Rubber Corp., Inc., East Union street, La Fayette, Indiana, has appointed as its distributor in parts of the state, the Lion Supply Co., corner of Fifth and Columbia streets.

The Eagle-Picher Lead Co., manufacturer of red lead, litharge, and orange mineral, 208 South La Salle street, Chicago, Illinois, celebrated September 19 as Flag Day, raising service flags at its different plants, showing 650 former employees in service.

The Firestone Tire & Rubber Co., at its August meeting,

adopted a resolution providing for insurance of all workers who have been in the employ of the company for more than thirty days. The amount increases for each year of service up to the fifth year, when the maximum of \$1,000 is reached.

Employes of The Goodyear Tire & Rubber Co. and their friends to the number of 50,000, attended the third annual field meet and family picnic at the company's forty-acre athletic field, Seiberling Park, on Labor Day. Over 500 employes took part in the various contests, and a community sing and dancing followed the athletic events at the end of the day.

The Amazon Rubber Co., Akron, Ohio, has purchased the tire accessory business of the O'Neil Tire & Rubber Co., including the exclusive right to the name "O'Neil," the good-will of the trade, and all unfilled orders on hand. It will put out reliners, wing blowout patches, lace-on boots, cementless patches, etc., under the name "O'Neil Pioneer Accessories."

TAUNTON RUBBER CO. ELECTS OFFICERS.

The Taunton Rubber Co., Taunton, Massachusetts, at a stockholders' meeting held September 13, 1918, elected the following officers who are also directors: William L. Gifford, president; Joseph L. Gifford, clerk and treasurer; Charles S. McCall, Henry G. Crapo, and Warren Swift. Joseph L. Gifford, who has recently acquired a controlling interest in the company, retains the management of the company which he has had in charge for the last four years and there will be no radical changes in the business affairs of the company.

QUABAUG RUBBER CO. ELECTRIFIES PLANT.

The Quabaug Rubber Co., North Brookfield, Massachusetts, is installing electrical equipment for motive power which is to be supplied by the Central Massachusetts Electric Co. at 22,000 volts, amounting to about 700 electric horse-power. When this installation is completed, steam will be used only for heating purposes and the vulcanization of rubber goods.

TRAVELER TIRE AND RUBBER CO. TO BUILD.

The Traveler Tire and Rubber Co., Traveler Building, Philadelphia, Pennsylvania, has acquired title to three acres of ground on the Pennsylvania & Reading railroad, between Hellertown and Bethlehem, for the purpose of erecting a factory for the manufacture of automobile tires. The officers of the company are as follows: Guy de la Rigaudiere, president; Victor Durand, Jr., first vice-president; G. J. P. Raub, second vice-president; E. E. Pollard, secretary and treasurer. The board of directors includes the above and Latimer R. Baker, Henry L. Renard, Martin H. Fritz, and Joseph Reichl.

CANADIAN NOTES.

THE Canadian National Exhibition has opened in Toronto under most favorable conditions. Some twenty-five or thirty new features have been added this year for the comfort and entertainment of exhibitors and visitors.

Getta Percha & Rubber, Limited, has an exhibit of tires in the Transportation Building, and a showing of miscellaneous products in the Process Building. An immense rubber belt is included, and the display of tennis and other sport shoes and "Tenax" soles is no small feature.

The Canadian Consolidated Rubber Co., Limited, has an extensive exhibit in the Process Building. Before a handsome background depicting a rubber plantation, every process of manufacture is shown from crude rubber to the finished products. Rubber soles and heels, sport shoes, and rubbers are featured strongly as well as new things in rubber-soled pumps, slippers, etc.

NEW INCORPORATIONS.

Cooper Rubber Co., July 29 (Tennessee), \$40,000. I. J. Cooper, J. W. Brumbaugh, R. D. Bond, H. H. Brenner and E. Wilkins. Principal office, Knoxville, Tennessee. To buy, sell, manufacture or otherwise deal in automobiles, bicycles, motor trucks, tractors, etc.

Dace Rim Corp., August 30 (New York), \$50,000. E. T. Burney, 3089 Broadway; E. E. Fish, 220 West 107th street; H. B. Wood, 102 West 75th street, all of New York City. To manufacture rims, tires, auto parts, etc.

Dilator Syringe Corp., August 24 (New York), \$50,000. C. Marks, 327 East 66th street; H. Cohen, 1259 College avenue; H. MacCormick, 57 West 130th street—all of New York City. To manufacture syringes, etc.

Grand Gravois Automobile Co., February 13 (Missouri), \$15,000. A. J. Dietrich, 3815 Michigan avenue; T. J. Mueller, 3408 Miami street; E. L. DeWinter, 3618 Bamberger avenue—all of St. Louis, Missouri. Principal office, 3664 Gravois avenue, St. Louis, Missouri. To deal in automobile supplies, solid, pneumatic, and cushion tires, and do automobile and truck repairing.

Great Lakes Rubber Co., April 18 (Wisconsin), \$100,000. D. C. Barbee, C. J. Zaizer and H. O. Wolfe. Principal office, Milwaukee, Wisconsin. To manufacture rubber goods of all descriptions.

Gudgell's Rubber Hub Co., The, August 17 (Illinois), \$140,000. L. Gudgell, L. Paridor and H. Hankins. To manufacture and deal in "Gudgell's Rubber Hub."

Hercules Rubber Co., Ltd., March 11 (Ontario, Canada), \$150,000. J. A. Campbell, A. Brown, H. W. Dawson, J. McMurchy, T. Thaiburn. Principal office, Main street, Brampton, Ontario, Canada. To manufacture and deal in all kinds of rubber goods.

Iowa National Rubber Co., August 17 (Delaware), \$50,000. E. E. Erb, E. M. Jauss, M. C. Miller—all of Harrisburg, Pennsylvania. Delaware agent, Delaware Registration Trust Co., 900 Market street, Wilmington, Delaware. To buy, sell and deal in crude or manufactured rubber, gutta percha, etc.

J. & D. Tire Co. of New York, September 6 (New York), \$50,000. F. McAllister, T. G. Patterson, both of 1761 Broadway, W. J. McAllister, 165 Broadway—all of New York City. To manufacture tires, etc.

Krebs Mining Co., June 15 (Delaware), \$100,000. H. J. Krebs, A. S. Krebs, both of Wilmington, H. V. Berg, Newport—all of Delaware. To purchase, lease or otherwise acquire any mines, mining rights, and mineral lands and to develop the same.

Maryland National Rubber Co., August 17 (Delaware), \$50,000. E. E. Erb, E. M. Jauss, M. C. Miller—all of Harrisburg, Pennsylvania. Delaware agent, Delaware Registration Trust Co., 900 Market street, Wilmington, Delaware. To buy, sell, and deal in crude or manufactured rubber, gutta percha, etc.

Morris Tire Machinery Co., The, August 6 (California), \$57,600. E. H. Furman, Grant Road, Mountain View; E. Wengler, 3736 20th street, San Francisco; H. Laughlin, 5028 Webster street, Oakland—all in California. Principal office, Los Angeles, California. To deal in rubber goods.

New York National Rubber Co., August 17 (Delaware), \$50,000. E. E. Erb, E. M. Jauss, M. C. Miller—all of Harrisburg, Pennsylvania. Delaware agent, Delaware Registration Trust Co., 900 Market street, Wilmington, Delaware. To buy, sell, and deal in crude or manufactured rubber, gutta percha, etc.

Ohio National Rubber Co., August 17 (Delaware), \$50,000. E. E. Erb, E. M. Jauss, M. C. Miller—all of Harrisburg, Pennsylvania. Delaware agent, Delaware Registration Trust Co., 900 Market street, Wilmington, Delaware. To buy, sell, and deal in crude or manufactured rubber, gutta percha, etc.

Pan-American Rubber Co. of New Jersey, The, August 23

(New Jersey), \$20,000. F. Christmann, A. F. Bottcher, F. Coelln—all of Paterson, New Jersey. Principal office, 91 Prospect street, Paterson, New Jersey; agent in charge, F. Christmann. To make, purchase, and sell rubber goods and all goods of which rubber is a component part.

Pennsylvania National Rubber Co., September 17 (Delaware), \$50,000. E. E. Erb, E. M. Jauss, M. C. Miller—all of Harrisburg, Pennsylvania. Delaware agent, Delaware Registration Trust Co., 900 Market street, Wilmington, Delaware. To buy, sell and deal in crude or manufactured rubber, gutta percha, etc.

Pyramid Manufacturing Co., August 21 (Maine), \$100,000. M. F. Hearn, R. W. Farris, C. L. Andrews—all of Augusta, Maine. To deal in waterproofing materials and other kinds of merchandise.

Roamer Tire & Rubber Co. of Akron, Inc., The, August 29 (New York), \$40,000. G. E. Rohmer, 726 Ocean avenue, Brooklyn; A. D. Paillot, 157 Queens building, Woodside; W. F. Timme, 593 Riverside Drive, New York City—all in New York. To manufacture and deal in tires and rubber goods.

Rubber Products & Supply Co., August 10 (Kansas), \$10,000. W. G. Barbour, B. A. Helfrick, P. Deam, E. Blake, F. Purnell and F. C. Dymock—all of Wichita, Kansas. Principal office, Wichita, Kansas. To transact a general mercantile, jobbing and manufacturing business in rubber goods, automobile tires, tubes and accessories.

Tillinghast Rubber Co., Inc., B. C., August 23 (Pennsylvania), \$75,000. L. W. Tillinghast, A. W. Tillinghast, J. K. Carr, J. H. Beith, C. Hess, Jr., and R. F. Crippen. Principal office, 236 Market street, Philadelphia, Pennsylvania. To manufacture tires and tubes, rubber clothing and footwear, mechanical rubber goods, and toys.

West Virginia National Rubber Co., August 17 (Delaware), \$50,000. E. E. Erb, E. M. Jauss, M. C. Miller—all of Harrisburg, Pennsylvania. Principal office with the Delaware Registration Trust Co., 900 Market street, Wilmington, Delaware. To buy, produce, sell, trade and deal in any and all kinds of crude and manufactured rubber, etc.

Wheel and Rim Works Corp., August 30 (Delaware), \$600,000. S. B. Howard, G. V. Reilly, A. W. Britton—all of 28 Nassau street, New York City. Principal office with the United States Corp. Co., 311 South State street, Dover, Delaware. To manufacture and deal in automatic signal horns, carpet sweepers, aeroplanes, tractors, automobiles, etc.

Zwebell Brothers Co., July 23 (Wisconsin), \$15,000. H. A., A. B. and A. R. Zwebell. Principal office, Milwaukee, Wisconsin. To manufacture a machine to repair automobile tires, known as the Zwebell retreading machine, and molds.

CLAIMS AGAINST BATAVIA AND SIMPLEX RUBBER COS.

A notice to creditors of The Batavia Rubber Co. and The Simplex Rubber Co. of America, Inc., Batavia, New York, which some time ago went into the hands of a receiver, states that in order to be considered, all claimants must file duly verified claims against either or both of these concerns on or before October 7, 1918, with Maxwell H. Bochow, receiver, at the office of his solicitors, Breed, Abbott & Morgan, 32 Liberty street, New York City.

RUBBER CHEMIST WINS PROMOTION.

The recent promotion of Charles P. Flora to the position of state superintendent of the Hood Rubber Co., East Watertown, Massachusetts, is his reward for intensive application along one unbroken line of endeavor for over thirteen years. Mr. Flora began his career with this concern as a chemist in 1905, later being appointed master of refining. In 1912 he became master of reclaiming and has also held the position of chemical engineer of the concern. He is a Yale graduate and enjoys great popularity throughout the Hood organization.

CLARENCE J. WELCH.

BECAUSE of the announcement that Clarence J. Welch, manager of the motor-truck tire department of the United States Tire Co., has been advanced to the position of assistant sales manager, that gentleman is receiving the congratulations of his host of friends in all parts of the country. The promotion is fully earned and deserved, for Mr. Welch has had a practical and commercial experience extending over a decade with the company and its predecessors.



CLARENCE J. WELCH.

ing from the latter in 1905. After some time with a regalia manufacturing concern, and four months in a piano factory, he went to Detroit as salesman for the Cable Piano Co. This, however, not suiting him, he entered the employ of Morgan & Wright, September 1, 1907, and spent a year in the factory, another in the sales department, learning the tire business from the bottom. In 1909 he was made assistant manager of the bicycle and motorcycle departments of that company, and when the concern was made a part of the United States Tire Co. in 1911, he went to Chicago, Illinois, as assistant to J. C. Weston, who, as central district manager for the new company, was in charge of its business in twenty-two central states. At that time Mr. Welch had charge of the bicycle, motorcycle and truck tire sales. He made such phenomenal sales records in these departments that in 1913 he was transferred to the general offices of the company in New York City and given general charge of the motor-truck tire department. His success in that field has led to his recent promotion. His new position opens up a much wider field of responsibility and opportunity.

Mr. Welch is a member of the Society of Automotive Engineers, The Motor Truck Club of America, and the Wykagyl Country Club of New Rochelle, New York, in which suburb of New York City he has his residence.

STERLING TIRE CORP. BRANCH MANAGERS.

The Sterling Tire Corp., Rutherford, New Jersey, announces the following appointments: W. C. Clark, formerly connected with the company's branch at Rochester, New York, now manager at Bridgeport, Connecticut, succeeding W. M. Cowles who has resigned because of poor health; George Buckridge now manager of the company's sales branch at Albany, New York; Howard Lacey, formerly detailed on special sales work in New York, now manager of the company's branch at Hartford, Connecticut; J. P. Stiles, formerly a salesman at the company's branch at Newark, New Jersey, now manager of its branch at Providence, Rhode Island.

PURCHASING AGENTS ADOPT A STANDARD CATALOG SIZE.

The National Association of Purchasing Agents, acting on the consensus of opinion of twenty-four associations, representing various industries, professions and trades, urges that all catalogs meant for purchasing agents be made $7\frac{1}{2}$ by $10\frac{1}{8}$ inches, or, in the case of small booklets of the half sizes, if saddle stitched, one-half this size so that they will open up to the full size for filing.

Not only will this standardization facilitate buying, because catalogs can be filed according to classes of material rather than size, but it is claimed that it will result in saving millions of dollars annually in the printing business and will release for other work 30,000 employees formerly employed on hand-fed presses.

DRIVER-HARRIS IN CANADA.

The Driver-Harris Co., Harrison, New Jersey, has incorporated in Canada as the Canadian Driver-Harris Co., Limited, at Walkerville, Ontario, the date of incorporation being June 6, 1918. At present it will manufacture nichrome castings and does not contemplate the making of rubber-insulated wire. The officers are: Frank L. Driver, president; Arlington Bensel, first vice-president; Leon O. Hart, second vice-president; Leroy Edwards, secretary and treasurer.

RUBBER MANUFACTURERS RED CROSS AUXILIARY.

Managers of the various rubber companies represented in Fargo, North Dakota, by wholesale factory branches recently had a dinner at the Gardner for the purpose of discussing the formation of an auxiliary to the local Red Cross, to be known as the Rubber Manufacturer's Red Cross Auxiliary, and composed of the various branch employees numbering about fifty. Arrangements for such an organization are now being completed. Those present at the dinner were: C. J. Burns, Ajax Rubber Co., Inc.; A. T. Severs, Firestone Tire & Rubber Co.; R. M. Hakins, ber Co.; C. A. Moshier, The Goodyear Tire & Rubber Co.; J. P. The Fisk Rubber Co.; C. A. Williams, The B. F. Goodrich Rub-Chambers, Marshall-Racine Rubber Co.; and D. B. Murdock, United States Tire Co.

RUBBER COMPANY TRUCKS HELPING THE RAILROADS.

Completion of a census by The B. F. Goodrich Co., Akron, Ohio, of the volume of motor truck transport on the Cleveland-Akron highway discloses the dramatic story that the relief to the railroad lines between these important centers is 1170 per cent over nine months previous. In car figures, this means that this 40-mile highway is giving 885 freight cars a week to other communities for more vital tonnage. If only an average of 600 car-releases a week is maintained for twelve months, this busy roadway will have saved for the nation 31,200 freight cars.

These statistics tell more vividly than all phrases how potential is the aid being given the hard-pressed railroad systems of the country. They reveal likewise the tremendous strides made in a transportation industry that may in time rival the railroads. Indeed, the Goodrich company is taking a leading part in the formulation of plans whereby the region of which Cleveland forms the center, extending to Toledo on one hand and Buffalo on the other, will be traversed by motor trucks, making it possible to move thousands of tons of short-haul freight which has heretofore been handled by the railroads. Return-load bureaus are to be formed with the idea that every machine will be loaded to capacity both coming and going. There seems to be no reason why all the comparatively short-haul and less-than-carload shipments throughout the country cannot be entirely taken off the railroads if similar arrangements are effected by progressive firms in various industrial sections.

The Obituary Record.

A PIONEER MANUFACTURER.

FRANK CAZENOVE JONES, who died on September 20, 1918, at his home, 80 Park avenue, New York, was for many years connected with rubber manufacture in an important way. He was born in Washington, District of Columbia, in



FRANK CAZENOVE JONES

Mr. Jones, president; Mr. Townsend, secretary and treasurer, and Mr. Woffenden, superintendent. Ten years later, suffering from nervous breakdown, Mr. Jones disposed of his holdings, resigned as president of the Manhattan, and went away for a rest. His health restored, he again took up business. He became active in the Okonite company, of which he was chairman of the board of directors. He was also interested in certain rubber planting prospects, was president of Cera Company and a director in the New York Lubricating Oil Company.

Mr. Jones was a lineal descendant of John Paul Jones, of Revolutionary fame. He was also a grandson of Commodore Jacob Jones, U. S. N., who was captured with the frigate *Philadelphia* in the war with Algiers, was held a prisoner there for twenty months, and afterward commanded the *Wasp*, which defeated the British sloop *Frolic* in the War of 1812.

Mr. Jones was one of the first to appreciate the value of engineering and of chemistry in rubber manufacture. A man of great energy and enthusiasm, his frail body could not keep pace with his eager spirit. He leaves many warm friends, and no enemies.

PRESIDENT OF BRECK RUBBER CO.

James H. Breck, president and treasurer of the Breck Rubber Co., Springfield, Massachusetts, passed away at his home in Longmeadow on August 2, 1918, at the age of 64. He had been in the rubber business for 38 years and was well known in Springfield business circles.

Mr. Breck was born in Wethersfield, Vermont, but lived the greater part of his life in Springfield. He was married January 15, 1899, and is survived by his widow; a son, Robert Gifford; two brothers, Charles G. and Martin D., both of Springfield; and two sisters, Mrs. C. S. Kempton, of Longmeadow, and Mrs. Clarence Paddock, of Lynn.

Mr. Breck was fond of outdoor sports and fishing and was a member of and an active worker in the local lodge of the Ancient Order of United Workmen.

A WELL-KNOWN BELTING SALESMAN.

James F. Holt, for more than a quarter-century salesman for the Boston Belting Corp., died at the residence of his sister at Spofford, New Hampshire, September 4, aged 70 years.

Mr. Holt was born in Spofford, then known as Chesterfield Factory, June 13, 1847, and was educated in the public schools, also taking a course at Comer's Commercial College in Boston, Massachusetts. He enlisted and served the last year of the Civil War in the 18th New Hampshire Regiment, taking part in several important engagements, and was at one time a dispatch carrier. After being mustered out, he learned the machinist's trade at Spofford, later working on shoe machinery at Lynn, Massachusetts. His first connection with the rubber business was as traveling salesman for the Hall Rubber Co., Boston, covering New England, New York and some western states. Later he joined the sales force of the Revere Rubber Co., and for the last 26 years had been associated with the Boston Belting Corp., covering the paper-mill trade in New England, as well as some other sections of this country and Canada. His practical mechanical experience proved of great value in introducing rubber-covered rolls in paper mills, and he was successful in devising and adapting other kinds of mechanical rubber goods for use in the paper industry.

Mr. Holt was twice married. He is survived by a daughter and grandson. He a 32nd degree Mason, an Odd Fellow, and a member of the Ancient Order of United Workmen, Grand Army of the Republic, Maine Quarter Century Association and the Salem Masonic Club.

Mr. Holt was a typical New England product, an old-fashioned, friendly, traveling salesman, a type becoming exceedingly rare. A Yankee of Yankees, he was known from one end to the other of his territory, and held in the highest regard. Always at home, in the office of the big mill owner, or in the country store, he swapped stories, cracked jokes and held his customers by his geniality, fairness, and knowledge of men and of his wares.

During his illness, he received scores of letters from his friends and customers, and he delighted to talk of his friends and his work until within a few days of his death.

A VETERAN RUBBER SALESMAN.

Watkin W. Griffiths died at the home of his brother in Utica, New York, on September 15. He entered the employ of the Hodgman Rubber Co. in 1875 as general salesman, and was identified with the company until his death, although for the last six or seven years he was not active in business on account of ill health. He was a representative of the old order of rubber salesmen of forty or fifty years ago.

A MAN OF LARGE AND VARIED INTERESTS.

Charles Minot Weld, president of the O'Bannon Corp., manufacturer of carriage cloths and coated fabrics, died August 27 at his home in Milton, Massachusetts, as the result of a shock. He had been in poor health for some months.

Mr. Weld was born in Boston on October 2, 1858. He graduated from Harvard University with the class of 1880, after which he entered a business career and in a very short time was identified with numerous corporations, banks and other interests. For many years he was a member of the dry goods commission house of Amory, Browne & Co., Boston.

He became director and was elected president of the O'Bannon Corp. about four years ago, but could give but little of his time to that concern, being on the directorates of twenty or thirty prominent organizations, including insurance, banking, railroad, textile, and public service corporations.

Mr. Weld was a member of the Somerset, Harvard, and Exchange clubs, of Boston, and the Country Club of Brookline, Massachusetts. He is survived by his widow, two sons, and three daughters.

A FIRE HOSE SYMPOSIUM.

Such well-known hose experts as W. T. Cole, president, Fabrie Fire Hose Co.; E. G. Kimmick, experimental department, The Goodyear Tire & Rubber Co.; C. W. Hardin, manager of mechanical sales, The Republic Rubber Co.; S. A. Coombs, assistant general manager, New York Belting & Packing Co.; J. M. Miller, Empire Rubber & Tire Co.; E. Downs, chief chemist, New Jersey Car Spring and Rubber Co., Inc.; and others reply in a very interesting manner to certain questions in "Fire and Water Engineering." In a letter to our contemporary an inquirer refers to the fact that some cities, in their specifications for 2½-inch double-jacket rubber-lined cotton fire hose, allow not more than two revolutions at 400 pounds pressure per square inch and a maximum increase in external diameter of 1/16 inch. He asks what the significance of exceeding one or more of these requirements would be and whether it would matter if the hose had a cemented or a loose inner tube. The replies point out that undue elongation of the hose means that the jacket is woven with a loose warp, or that the fillers are spread too far apart. Stress is also laid on the necessity of using a middling grade of yarn, as Sea Island cotton or grades approximating it would be too elastic. Various serious evils of elongation are pointed out. For instance, if a fireman is at the top of a ladder with a 500-foot line of hose under a working pressure of 125 to 150 pounds and each 50-foot section stretches only 30 inches, a total of 300 inches, and the water is suddenly shut off, or a length of hose bursts somewhere back in the line, the nozzle will immediately be snapped back 300 inches, which is liable to pull the fireman off the ladder or pull down the whole ladder. Or again, when a fireman gets into a position on a roof where it is difficult to stand, when the water is turned on, if the hose pushes forward, it might push the man off the roof. With regard to twisting, as a double jacket hose is composed of two single jackets, the filling threads must run in opposite directions to each other; then, if the two jackets conform perfectly, there will be little or no twist. The objection to twisting is based on the probability of the couplings being loosened if the twist is in the wrong direction. Besides which, if hose stretches excessively, the stretch will be "taken up" in snakes in the line, the water will not travel straight to the fire, it will be retarded by friction, and the pressure will be reduced. Regarding the difference between a cemented or a loose inner tube, it seems that the adhesion has very little to do with the service of the hose. And yet, if the tube were cemented to the inner jacket for part of the surface, it might reduce the likelihood of a loose section of tubing being crowded to the discharge end of the hose while under pressure.

FIRMS JOIN TO EXPAND FOREIGN TRADE.

By grace of the recently enacted Webb-Pomerene law, permitting American manufacturers to join forces for the purpose of promoting foreign trade, a combination of forty-four important establishments, styled the Allied Industries Corp., with offices at 151 Fifth avenue, New York City, has been formed to introduce American goods abroad and promote trade with the seventy foreign markets of the world now open for immediate and systematic development. Over \$100,000,000 in domestic annual sales is

represented in the merger, of which Alfred I. duPont, of Wilmington, Delaware, is chairman, and which is affiliated with the French-American Constructive Corp.

The Allied Industries Corp. will represent responsible manufacturers and sell their goods under their own trade marks at a selling commission based on the amount of goods sold and shipped, plus a bonus on a guaranteed minimum sale. For the first group of manufacturers there will be no advance selling charges or fee. The corporation is financed to take the initial risk and burden of expense, enabling it to extend credits to responsible foreign buyers when necessary and at the same time securing immediate cash payments for its American clients at a fractional discount.

Representatives will be located in the various foreign markets and permanent expositions will show American products in New York, London, Paris and other trade centers for the benefit of foreign buyers. Negotiations are in progress with 658 firms, and the firms so far allied with the corporation include makers of rubber articles and toys, textile goods, chemicals, etc. It is stated that an important business in rubber products will be done.

RAINCOAT MEN TO GET A BILL OF PARTICULARS.

The raincoat manufacturers indicted under the Sabotage Act have made the first move in their defense, resulting in an order issued by Judge J. C. Hutcheson in the Criminal Branch of the United States Federal Court, directing the Government to furnish the defendants with a bill of particulars concerning the alleged imperfections in the garments supplied by them. The manufacturers contend that the raincoats were made according to specifications and that after acceptance by the Government inspectors their responsibility as manufacturers ceased.

FIRST RAINCOAT FRAUD CASE TRIAL BEGINS.

The trial of the first of the raincoat fraud cases was opened before Judge E. J. Hutcheson in the Criminal Branch of the United States District Court at New York, on September 17. In this first case there are three defendants, Captain Aubrey W. Vaughan, of the Quartermaster General's Office, Felix Gould, a promoter, and David L. Podell, a lawyer. More than a score of men are involved and will be tried separately. Captain Vaughan has pleaded guilty to a charge of bribery and is expected to appear as a witness for the Government. It is alleged, among other things, that the H. Rosenfeld Raincoat Co. was incorporated mainly for the purpose of concealing the true nature of the transactions to be carried out.

INCREASED PRODUCTION OF GILSONITE AND OZOKERITE.

The native bitumen, including gilsonite, elaterite and ozokerite, marketed from mines and quarries in the United States in 1917 was 80,904 short tons, a loss of 17,573 tons, or 18 per cent, compared with 1916. The market value of the output in 1917 was \$735,924, a loss of \$187,357, or 20 per cent, compared with 1916.

The production of gilsonite and ozokerite was increased considerably in 1917, but the gain credited to these varieties was insufficient to offset the loss in the production of elaterite and other products.

MAGNESITE.

Magnesium carbonate and the light and heavy calcined magnesia used in the rubber trade are derived from the mineral magnesite, of which extensive deposits are found in the state of California and Washington. These sources of magnesite render the United States independent of oversea sources and the domestic supply is much more free from lime than Canadian magnesite, which comes from Grenville, Quebec. The United States Geological Survey estimates that the domestic production for the entire year 1918 may be about 225,000 tons as against 316,000 tons in 1917.

Scientific Inspection of Raincoats in Shops Manufacturing on Section Basis.

By H. Thorpe Kessler.

THE solution of every problem in manufacturing depends largely on proper planning.

The careful and systematic inspection of raincoats requires the same "tactics" one would apply to other commodities.

To maintain a standard of quality at a time when production standards are being revised from day to day, and if the added production is to be made with apprentice help, it demands a close and constant adherence to instructions.

Before a new piecework price can be scientifically set, one must make a careful study of both the time element and necessary motions.

When this company made its first deliveries of slickers (now called raincoats) to the United States Government, only one examination was made of the garment. If all the garments were made by competent employees this method properly supervised would be sufficient. However, the majority of garments are being sewed, cemented and finished by workers who but recently have become acquainted with this trade. Final examining alone does not prevent the poorly stitched or cemented seam.

For the reason just outlined, we introduced into our shops sectional inspection with decided success. To make the method clear, we refer to the various inspections as sectional inspection, departmental inspection, and final inspection.

SECTIONAL INSPECTION.

In each division is an inspector whose sole duty is to see that those parts of the garment sewed or cemented in that section are all in accordance with government specifications both as to measurement and quality. Records are kept in each shop which indicate the clock number of employee working on every part of the garment. The inspectors are responsible to the management—not the shop manager or foreman of the section. In case the work of any employee is not up to standard, the inspector is instructed to call the section foreman's attention to the unsatisfactory work. If the work complained of is not remedied at once, the inspector's duty is to report the matter to the shop manager. The poor work is then reported directly to the general manager, providing the shop manager does not improve the work.

DEPARTMENTAL INSPECTION.

In each shop there are a number of departmental inspectors who look over the garment for either poor cementing or unsatisfactory sewing. Each inspector examines the coat only for defects in the department he represents. This means that each garment is handled by two different departmental inspectors.

While this is a duplication of work in handling the garment, it has secured better results and will be continued until the working force is thoroughly competent. A thoroughly competent force would mean that gross rejections should not exceed six per cent.

FINAL INSPECTION.

The final inspection is guided by the following instructions:

EXAMINERS' INSTRUCTIONS.

GOVERNMENT RAINCOAT. (SPECIFICATION No. 1317.)

1. Turn right and left sleeve inside out:
 - a. Bottom $\frac{1}{4}$ inch D. S.—raw edge.
 - b. Strapping top sleeve.
 - c. Cementing under sleeve.
 - d. Reinforcement and hardware.
2. Turn both sleeves right side out.

3. Shoulder tabs:
 - a. Two inches at shoulder seam.
 - b. Tapers to $1\frac{1}{4}$ inches at top.
 - c. Top $\frac{1}{2}$ inch from stand.
4. Collar:
 - a. Top—4 inches wide.
 - b. Cementing; special attention.
 - c. Tabs securely tacked.
 - d. Test buttons.
 - e. Turn top collar—note undercollar stitching.
 - f. Stitching undercollar at corners.
 - g. Test hanger.
5. Yoke:
 - a. $1\frac{3}{4}$ inches deep from bottom stand.
 - b. Bottom $\frac{1}{4}$ inch D. S.—raw edge.
 - c. Stitching at bottom.
6. Eyelets: (4) Left.
7. Side seam—cementing—right.
8. Pocket: Left.
 - a. Opening $7\frac{1}{2}$ inches.
 - b. Inside stitching, $1\frac{3}{4}$ inches by $8\frac{1}{4}$ inches.
 - c. Three rows stitching, $3/16$ inch apart.
 - d. Test tacking top and bottom.
9. Clasp: Right.
10. Bottom:
 - a. Hemmed $\frac{1}{2}$ inch D. S.
 - b. Stitching at corners and across bottom.
11. Left facing:
 - a. Fly, 29 inches long, 4 inches at second take-up.
 - b. Stitching of fly.
 - c. Take-ups securely riveted.
 - d. Bottom of fly tacked.
12. Pocket: right same as No. 8.
13. Eyelets: (4) right.
14. Side seam cementing right.
15. Turn coat inside out.
16. Right facing:
 - a. Compare length.
 - b. Clasps and take-ups even.
 - c. Test caps.
 - d. Button even with button-hole, 8 inches from bottom.
17. Strapping:
 - a. Width $1\frac{1}{4}$ inches.
 - b. Shoulder seam.
 - c. Armhole.
 - d. Facing.
 - e. Pocket.
 - f. Ventilation.
 - g. Side seam.

Test all strapping.
18. Contractors' stamp—must be distinct.
19. Turn coat—see No. 17.
20. Test caps on take-ups.
21. Put your number under yoke.

There may be some difference of opinion as to the proper method of examining a garment. In connection with our study, we asked a score of examiners to show us their methods of handling a garment. A careful comparison of our notes indicated that no two men handled the coat alike.

Our next step was to conduct a written examination to learn which parts of the garment were overlooked.

For several months, each final inspector has handled the coat in the order outlined in the instructions. Each week all inspectors are called together and a report is read giving the total number of rejects received from the quartermaster during the previous week, the percentage, the reasons for their return, and the number of rejected garments examined by each inspector.

After reading the weekly report, the accumulated totals are read and the standing of each inspector both as to quantity and quality is determined.

A minimum rate is paid all examiners; promotion and increase in pay is entirely determined from their record as shown by rejection reports by inspectors.

After a shipment of rejections is received and the count is verified, the following information is secured: number of coats rejected by reason; number of coats rejected by shops and reason; number of coats rejected by inspectors.

These figures are posted to a report with accumulative totals and percentages.

Each sectional, divisional, and final inspector is shown re-

jected coats which were originally passed by him. In this way each inspector can see his own careless work.

The "display" of rejected coats is held once each week at which time a meeting is called to go over the weekly report of rejects.

The report on rejects is then handed over to the chief inspector whose sole duty is to improve the work in that section of the shop where the largest percentage of rejections has occurred.

RUBBER TRADE INQUIRIES.

THE inquiries that follow have already been answered; nevertheless they are of interest not only in showing the needs of the trade, but because of the possibility that additional information may be furnished by those who read them. The editor is therefore glad to have those interested communicate with him.

(658.) A reader requests the address of a manufacturer of rubber bulbs.

(659.) A subscriber requests the addresses of importers of rubber goods in the United States, Canada, and South America.

(660.) An inquiry has been received for the addresses of manufacturers of the latest machinery for the manufacture of rubber footwear such as overshoes, gaiters, and boots.

(661.) A reader requests information as to where he can purchase transfers for printing on inner tubes.

(662.) A vulcanizing concern requests the addresses of proofers of cloth.

(663.) A subscriber asks for the name of a manufacturer of hose-winding machinery.

(664.) An importing and exporting concern requests the address of a manufacturer of tapping tools for use on *Hevea* trees.

TRADE OPPORTUNITIES FROM CONSULAR REPORTS.

Addresses may be obtained from the Bureau of Foreign and Domestic Commerce or its district or co-operative offices. Request for each should be on a separate sheet, and state number.

(27,381.) A representative of a Dutch firm in the East Indies and Singapore, at present in the United States, desires to get in touch with manufacturers of sulphur, caustic soda, rosin, zinc white, linseed oil.

(27,394.) An agency is desired by a firm in France for rubber shoes.

ATHLETIC MATERIAL FOR MEN AT TRAINING CAMPS.

The War Department Commission on Training Camp Activities announces that athletic material sufficient to supply 1,750 companies, or 125 complete regiments, has been purchased, an appropriation of \$250,000 having been obtained for this purpose.

The supplies include among other items, 3,000 Rugby footballs, 7,000 soccer footballs, 3,500 volley balls, and 1,750 medicine balls.

As part of the commission's campaign to raise funds for the purchase of athletic equipment for the camps, it is announced that with the sum of \$3,600 obtained from the United States National Lawn Tennis Association the commission has purchased and distributed 2,700 balls and many rackets and nets.

NO ENEMY INTEREST IN EBERHARD FABER RUBBER CO.

The business of A. W. Faber, of Newark, New Jersey, that was sold by the Alien Property Custodian on September 17 should not be confused with the Eberhard Faber Rubber Co., Brooklyn, New York, or the Eberhard Faber Pencil Co., Newark, New Jersey, because the records disclose no enemy interest in either of the latter companies or in the partnership of Eberhard Faber, which is the sales organization of the Eberhard Faber companies.

SCRAP RUBBER DIVISION, NATIONAL ASSOCIATION OF WASTE MATERIAL DEALERS.

THE fall quarterly meeting of the National Association of Waste Material Dealers was held at the Hotel Astor, New York City, on Tuesday and Wednesday, September 24 and 25, at which time the Scrap Rubber Division, David Fineberg, chairman, met and discussed matters of interest in a "win the war" spirit of conservation, evident throughout the proceedings. The proposal was discussed to limit bales of waste rubber to a maximum weight of 1,500 pounds as an aid to handling at docks and warehouses where labor is scarce. Some dealers make a practice of putting up unwieldy bales of 2,500 to 3,000 pounds. Mr. Ralph Loewenthal suggested that the question of bale weight ought to be studied experimentally to determine the most suitable weight as regards economy of space, burlap and labor. The meeting, however, took no action.

The Interstate Commerce Commission Classification Committee has held hearings in New York the past summer at which the scrap-rubber dealers were represented in protest against the proposed requirement of tying bundles of scrap automobile tires in three places with steel baling wire to secure fourth-class shipping rates. Secretary Charles M. Haskins of the Scrap Rubber Dealers Section, argued in favor of permitting optional use of one-quarter-inch diameter rope, wrapped twice and tied in three places on the bundles. Photographs were exhibited illustrating the use of both wire and rope ties and report made of a practical test by shipment of sample rope-tied bundles which arrived at destination in perfectly secure condition. The "density" of such a bale measuring 34 inches diameter by 18 inches thick is 13 $\frac{1}{4}$ pounds per cubic foot occupied. The committee proposed that rope-tied bundles should bear third-class rate, and has taken under advisement the proposed optional use of rope or wire ties at fourth-class rate.

The scrap-rubber dealers welcome the recent appointment of two of their number, Messrs. Ralph M. Loewenthal and Herman Muehlstein, on a joint arbitration committee with the rubber reclaimers for the settlement of disputes arising over questions of acceptance of deliveries, etc.

NEW OFFICERS OF INTERNATIONAL STAMP MANUFACTURERS' ASSOCIATION.

At the annual convention of the International Stamp Manufacturers' Association in Detroit, Michigan, the following officers were elected for the coming year: R. F. Hershey, Pittsburgh, Pennsylvania, president; Charles L. Safford, Chicago, Illinois, first vice-president; Thomas Wright, Cincinnati, Ohio, second vice-president; Bert A. Stewart, Philadelphia, Pennsylvania, third vice-president; E. Q. Cannon, Salt Lake City, Utah, fourth vice-president; A. Woodruff, Auburn, New York, treasurer; F. A. Rees, Chicago, Illinois, secretary; auditors—J. P. Soloman, Detroit, Michigan; Stan. Bevan, Kansas City, Missouri; A. S. Adams, St. Louis, Missouri; directors—William Jenkins, chairman, Pittsburgh, Pennsylvania; George Westbrook, Hartford, Connecticut; G. Fred Hiss, Columbus, Ohio; M. L. Willard, Chicago, Illinois, and B. Cairns, Toronto, Ontario, Canada.

SALE OF A. W. FABER NOT APPROVED.

The plant of A. W. Faber, Newark, New Jersey, maker of stationers' rubber goods, was sold at public auction by the Alien Property Custodian, September 17, for \$145,000, to Theodore Friedeburg, 30 Church street, New York. Weldon Roberts, of the Weldon Roberts Rubber Co., Newark, New Jersey, was the only other bidder. The sale, however, was not approved by the advisory board and the matter was referred to the sales department in Washington, which will decide whether the property will be readvertised or what disposition will be made of it.

THE RUBBER TRADE IN BOSTON.

By Our Regular Correspondent.

THE rubber manufacturers of this city and vicinity have been handicapped for a long time by the desertion of many of their workers to other industries. Many employees, male and female, have found that munition factories and other war-work establishments pay larger wages, and as a consequence rubber workers have decreased materially in number. It is anticipated that the new draft will cause an even greater reduction of available rubber workers, unless the men drafted are pronounced essential to the carrying on of the war. Every day more and more women are being taught to do work which hitherto had been considered men's exclusively, and it is but fair to say that in many cases the experiments have proved successful. Just this writing, however, a very serious additional shortage of help is noted because of the semi-epidemic of "Spanish Influenza" or old-fashioned grip, which is decimating some of the rubber-factory forces. It is hoped, however, that this is but temporary, and that the presence, in most of the factories, of medical advisers, who are instructing the help in preventive measures, will soon overcome this difficulty.

* * *

Patriotism runs strong at the plant of The Fisk Rubber Co., at Chicopee Falls, Massachusetts. The working forces have not only contributed their share in supporting the various organiza-



LIBERTY CHORUS REHEARSAL AT THE FISK RUBBER CO. FACTORY.

tions, and in buying Liberty Bonds, but are also ably represented in the rank and file "over there." The knitters and Red Cross workers are busy at the noon hour and after the work-day is over. The war gardens have been well tilled and are now being harvested. The Liberty Chorus is the latest activity planned along the line of the government suggestion of community singing. The organization has a trained leader, and a small portable organ is used, the rehearsals being held at the noon hour, Thursdays for the factory group, and Fridays for the Administration Building group. Occasionally, when the weather is suitable, both groups unite in an open-air rehearsal. The progress made is most satisfactory, and the result will be that in any community sing which may be held in Springfield or Chicopee, the "Fiskers" will do their full share in adding their volume and harmony.

* * *

Speaking of war gardens, those of the Boston Rubber Shoe Co. Factory No. 2 at Melrose are yielding well, showing that rubber workers are excellent amateur farmers. There are nearly 200 such plots on land contiguous to the big factory. Each of these is 40 feet square. The land is furnished free, and is plowed, harrowed and fertilized by the company, which also furnished the seeds at cost. The main crop this year is potatoes, although a large quantity of other vegetables was planted. In addition to the gardens of the employees, the company also planted several acres of potatoes, and one acre of corn.

* * *

N. Lincoln Greene, of the clothing division of the United States

Rubber Co., is a busy man at all times, but especially so just now, as he is making frequent trips to Washington in his capacity as chairman of the clothing division of the War Service Committee of the Rubber Industry, a committee which includes every manufacturer of rubber clothing in the country, if, as the said committee claims, the term "manufacturer" means a concern which makes its own cements and coats and vulcanizes its own fabrics, making up these into clothing. Those houses which purchase their fabrics already vulcanized, and their cement, according to the same authority, should be termed "makers." The distinction is worth adopting. At the present writing, Mr. Greene is in Washington in conference regarding specifications for the new coats to be made for the Navy. These will be double-faced textile with rubber between; and the coats made complete before vulcanization, which specification will confine the contracts to "manufacturers," none of the "makers" having facilities for this method of production.

* * *

The Davidson Rubber Co., in the Charlestown district of this city, finds that the elimination of styles has worked advantageously in its lines of water bottles and fountain syringes. Whereas three years ago more than 40 numbers were represented in these two items, to-day the company is manufacturing but two numbers of each, in two colors, and the result is that in this limited variety the orders aggregate far more than their production of the greater number of styles of the former period. Like all other concerns, the scarcity of help is a problem difficult of solution, but the steadily increased volume of output tends to show that measures taken to meet the difficulty promise success.

* * *

The A. S. Brock Rubber Co., manufacturer of hard-rubber specialties, of this city, with a factory in Lynn, is busy on government work, with enough rubber allotted to fill its contracts with the Government, but finds difficulty in obtaining enough to fill its orders from the regular trade. In this emergency it is using some of its machinery, usually employed on hard rubber, in finishing machine parts of metal. Like all other manufacturers, the war industries and the army demands have made inroads in the working force, in addition to which, at present writing, 30 per cent of its employees are away from the factory, because of the prevailing epidemic of influenza.

* * *

Mention is made elsewhere in this number of the release of Mr. Kidder, manager of the Boston branch of the United States Tire Co., that he may be enabled to serve under Charles A. Schwab in the Emergency Fleet Corporation. Almost simultaneously with his departure for this service, but in no wise because of it, his assistant, John C. Toomey, who has been connected with this branch for nine years, resigned in order to accept an important position with the L. A. Young Industries, Inc., Detroit, Michigan.

* * *

The recent cancellation of Government raincoat contracts because of alleged irregularities of some makers has redounded to the benefit of the United States Rubber Co., large additional orders having been placed, which results in greater activity than ever at the Cambridge and Stoughton factories of that company.

* * *

S. P. Sharples, the veteran analytical chemist well known in rubber manufacturing circles, who suffered a light shock last spring and has been away recuperating all summer, is again on deck with the same ambition for work which has characterized him for many years.

* * *

Roy Fraser has been appointed manager of the Boston office of the Pennsylvania Rubber Co., Jeannette, Pennsylvania. He was formerly a member of the Roy C. Fraser Co., of Montreal, Quebec, Canada.

* * *

Frank Venn has sold all interest in the business and patents of the Venn marker to the Boston Rubber Shoe Co., Malden, Massachusetts, a subsidiary of the United States Rubber Co.

Robert H. Montgomery succeeds William J. McNeill as local manager of The B. F. Goodrich Rubber Co., of Akron, Ohio, in Worcester, Massachusetts. Mr. McNeill entered government service in June.

Farley & MacNeill, 105-107 Federal street, Boston, have been appointed by the Dural Rubber Corp., Flemington, New Jersey, exclusive distributors for that company in Massachusetts and Rhode Island.

THE RUBBER TRADE IN RHODE ISLAND.

By Our Regular Correspondent.

THE ominous clouds caused by labor disturbances, that overshadowed the plants of the United States Rubber Co. at Bristol, Woonsocket, and Millville, for nearly two months were dispelled about the middle of September. After numerous conferences between the employees and the management of each plant concerned, an amicable understanding was finally reached, satisfactory adjustments made, and the operatives returned to their work.

In the meanwhile advantage was taken of the enforced idleness to make numerous repairs, renovations, and improvements necessitated by the unprecedentedly long period of constant operation at capacity speed, so that when the mills resumed they were in better condition than at any time for many months previous.

Improvements and extensions at the plant of the National India Rubber Co. at Bristol include not only additional buildings and equipment at the plant itself, but the establishment of several features of a social and economic character for the comfort and welfare of the employees. In addition to opening a restaurant at the mill, the company has recently purchased a large dwelling house and lot of land at the corner of High and Bourn streets. The house is to be remodeled and used as a day nursery for small children of the employees.

The newly erected brick addition to the plant has been completed and is being occupied and used exclusively for the production of footwear.

The Lynn Rubber Manufacturing Co. has completed the first of the buildings at its new plant at Warren and has begun the manufacture of rubber shoe-heels and soles. The plant is favorably situated in the east part of the town near the yards and station of the New York, New Haven and Hartford railroad. Further mention of the company's plans was made in the issues of THE INDIA RUBBER WORLD of April 1 and May 1, 1918.

Arrangements are well under way at the plant of the Alice Mill, of the Woonsocket Rubber Co., at Woonsocket, for the establishing of a department for the making of rubber boots. This is the first time since the erection of the Woonsocket mill that this move has been contemplated. Up to the present time the entire floor space of the Alice mill has been used for the manufacture of rubber shoes.

Thomas W. Dwyer, who was employed for a number of years at the factory of the National India Rubber Co., has received his commission as a second lieutenant in the Army after completing training at the officers' training school at Camp Lee, Petersburg, Virginia, where he has been since June 29. Previous to going to Camp Lee he was a sergeant at Camp Devens, Ayer, Massachusetts, having been appointed soon after his enrollment in the National Army.

Included in the list of individuals, firms and corporations assessed on valuations of \$50,000 and over in the annual report of the Board of Tax Assessors of Providence, as filed a few days ago with the City Treasurer, are the following identified with the rubber industry: American Multiple Fabric Co., \$94,380; Walter S. Ballou, \$86,840; Joseph Banigan Estate, \$1,045,580; Augustus O. Bourn, \$84,640; Bourn Rubber Co., \$180,300; Samuel P. Colt, \$219,060; Davol Rubber Co., \$500,000; Glendale Elastic Fabric Co., \$177,300; Joslin Manufacturing Co., \$485,080; Mechanical Fabric Co., \$190,200; Revere Rubber Co., \$830,100; United States Rubber Co., \$1,462,600.

Henry C. Wagner, superintendent of the Alice Mill, of the Woonsocket Rubber Co., was operated on at the Woonsocket Hospital, September 6 for gall stones and appendicitis.

Miss Anna C. Doran has resigned her position as school nurse in the public schools of Woonsocket to accept the position of nurse at the Woonsocket Rubber Co., succeeding Miss Essie McDonald, who has entered Red Cross work.

George A. Cragin, for the past two years general sales manager of the National India Rubber Co., Bristol, has resigned on account of ill health and returned to his home at Worcester, Massachusetts.

Amendments to articles of association have been filed at the office of the Secretary of State under the laws of Rhode Island, by the Glenwood Manufacturing Co., represented by Elmer K. Watson, president, and Alice M. Clark, secretary, for the purpose of engaging in the business of manufacturing and selling of textiles, fabrics, felts, rubber goods, and goods from raw materials.

THE RUBBER TRADE IN TRENTON.

By Our Regular Correspondent.

WHILE Trenton rubber manufacturers are 100 per cent patriotic and always willing to help the Government in the winning of the great war, they were surprised when informed that the Federal order restricting the output of tires would be extended to the first of the year. The news also surprised the many workmen who were laid off the first of August, who were of the belief that they would secure their old positions the first of October. Some of the tire-makers are working at other positions while the order is in effect.

The order of the War Industries Board calling for the elimination of many styles of rubber footwear for the duration of the war will not affect Trenton rubber industries. The Essex Rubber Co., Inc., is a big producer of rubber heels and soles, but no order has been received to change the style of the heels and soles now being made.

Rev. Joseph Howell, of Easton, Pennsylvania, who was pastor of the Presbyterian Church at Hamilton Square, New Jersey, has taken a position at the Mercer Rubber Co.'s plant at the latter place. He announces that he will turn his salary over to the Trenton Chapter of the American Red Cross.

John A. Lambert, treasurer and general manager of the Acme Rubber Manufacturing Co., has been appointed a member of the Community Board of the Trenton district and will assist the Federal-State Municipal Employment Bureau in the Municipal building, Trenton.

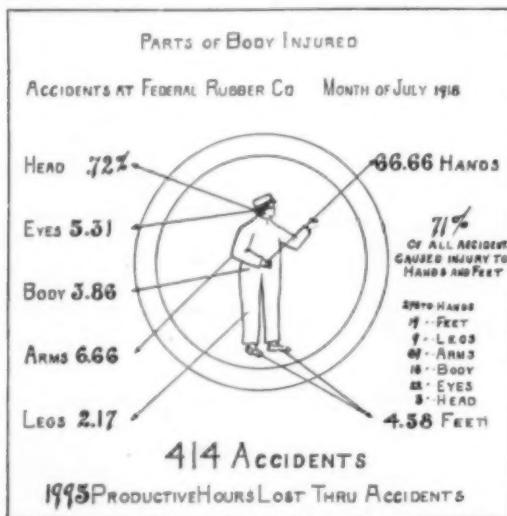
Joseph K. Lambert, assistant manager of the tire manufacturing department of the Acme Rubber Manufacturing Co., who enlisted in the Navy last June, is now stationed in the

Fourth Naval District, Philadelphia, Pennsylvania. He is the son of John A. Lambert, treasurer and general manager of the Acme company.

William J. B. Stokes, treasurer of the Thermoid Rubber Co., vice-president and treasurer of the Joseph Stokes Rubber Co., and vice-president of the Home Rubber Co., has been appointed chairman of the new Liberty Loan Committee for Trenton and Mercer County. An office has been opened in the center of the city, and there Mr. Stokes, who recently celebrated his sixtieth birthday anniversary, daily attends to the war-financing campaign, besides keeping in touch with his several rubber interests.

A MONTHLY ACCIDENT CHART.

In a campaign to reduce the number of accidents due for the most part to carelessness, The Federal Rubber Co., Cudahy, Wisconsin, is posting conspicuously in the factory a chart of the accidents for the previous month. The total number of accidents and the number of productive hours lost thereby are



stated, and the percentage for each part of the body is given. All employees are urged to sign a pledge to do and avoid certain simple things which will tend to avoid accidents.

THE KREBS MINING CO. INCORPORATES.

The Krebs Mining Co. has recently filed notice of incorporation in Delaware and will take over the mining interests of The Krebs Pigment & Chemical Co. of Newport, Delaware, manufacturer of Ponolith, in the states of Georgia, and Tennessee, where it has succeeded in locating and acquiring large deposits of ore and has erected washers and ore-dressing plants to prepare this for the manufacture of lithopone.

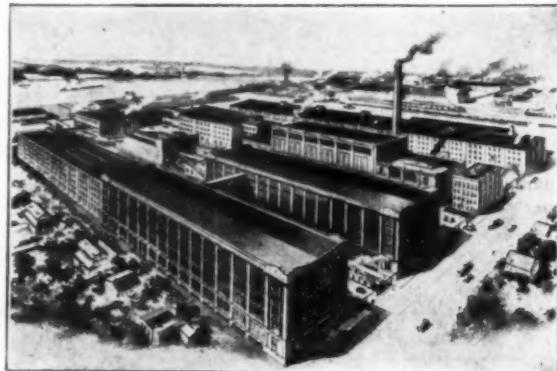
THE PIONEER ASPHALT CO. MANUFACTURING AGAIN.

The Pioneer Asphalt Co., Lawrenceville, Illinois, subsequent to the fire which destroyed its plant in July, has been endeavoring to dispose of its small existing stock of mineral rubber in an equitable manner and is now manufacturing it again, although in necessarily limited quantity. The company is now under new management and conducting rebuilding operations. When these are completed it hopes to give better material and service than ever before.

NEW YORK BELTING & PACKING CO. EXPANDS.

The New York Belting & Packing Co. is making extensive additions and alterations to its plant at Passaic, New Jersey. Several modern reinforced concrete buildings in course of

construction include two large five-story factories, a power house, and an enlarged office building. Machinery is being installed and direct-connected electric power is provided wherever practicable. A completely equipped machine shop provides facilities for mold making as well as the upkeep and construction of machinery.



PLANT OF THE NEW YORK BELTING & PACKING CO.

A very efficient plan has been developed to coordinate all departments and facilitate the progress through the plant of all goods in the various stages of manufacture. Greatly increased facilities are provided for the manufacture of power and conveyor belting, hose of all kinds, packings and special molded goods.

ALLEN MACHINE CO. EXPANDS.

The Allen Machine Co., Erie, Pennsylvania, manufacturer of hydraulic and rubber mill machinery, has recently acquired the plant and equipment of the Nagle Corliss Engine Works, to which it is moving its offices and adding the equipment of its own old plant. The newly acquired property includes, besides the heating system and various other buildings, a foundry 125 by 250 feet, equipped with traveling cranes and a main machine shop 130 by 332 feet, with a balcony 60 by 250 feet, also fitted with cranes. The Allen Company plans to cast its own rolls for rubber mills and calenders, as well as machining them.

LACQUER FOR SOLID TIRE STEEL RIMS.

The specifications of the United States Army, Ordnance and Quartermaster's Departments require that the steel rims of solid rubber tires shall be painted with a removable waterproof anti-rust material. A varnish-like preparation, known as Blue Removable Lacquer, originally prepared for protecting the bright parts of machinery, has been found to meet perfectly the specified requirements. This coating gives a blue semi-transparent coating and protects the metal from rusting while in transit. It may be removed with kerosene, gasoline, or turpentine, even two years after it is applied.

A GOODRICH DISTINCTION.

For the enlightenment of such of our readers as may be interested, we have secured the following information:

The B. F. Goodrich Co. is a New York corporation, with its principal office at 1780 Broadway, New York City, and its factory at Akron, Ohio, where it manufactures rubber goods of various kinds.

The B. F. Goodrich Rubber Co. is a Michigan corporation which is a subsidiary of The B. F. Goodrich Co., having its principal office at Detroit, Michigan, and its main business office at Akron, Ohio. This company sells the products of The B. F. Goodrich Co.

The Rubber Trade in Great Britain.

By Our Regular Correspondent.

WHEN I had the privilege the other day of seeing a review of American troops—and what big crowds they attracted—I was wondering how many of them came from Akron and other homes of the rubber industry. This inquisitive trait of mine cannot, of course, be satisfied, but at any rate I have been satisfied upon one point, and that is that the American soldier can smile, for I saw one in the act. The solemnity of the American when marching has been much commented on in Britain, though at the same time it can hardly be said that the business on which he or any other soldier is engaged is a laughing matter.

There is nothing new to be said about raw rubber, except that the gloom is deepening on the faces of shareholders who have become accustomed to 50 per cent dividends. Interest has centered a good deal around certain low-grade qualities which are in demand for special purposes. Pontianak, for instance, is difficult to obtain and odd lots of such brands as accra flake have come upon the market to take its place, having been rescued from the oblivion which is their normal due. As so much of the rubber work in progress is of good quality for government purposes the difficulty of getting hold of low-grade rubber has not caused much inconvenience.

So far as the details of the proposed luxury tax have been made public, there is not much to perturb the rubber trade. A mackintosh is not a luxury unless it costs more than \$24.20, which is a much higher price than is usually paid. Of course, even in peace-time one could pay as much for a special article marketed by one or two noted London firms, but these were mainly sold to officers and sportsmen, and as such purchasers will now buy them for service purposes they will not pay the tax. Waterproof clothing generally, as purchased in the shops, has shown a great rise in the last year, owing mainly to the rise in textiles and labor costs, and it may be said generally that the retail price of a year ago is the wholesale price of to-day. Thus the men's popular woven twill mackintosh has gone up from \$5.08 to \$8.47. The cloth in these garments has gone up from 18 cents per single yard to 60 cents.

Lawn tennis balls are in short supply this summer, the price being up 50 per cent. Many dealers are sold out and are unable to replenish their stocks. This is due to shortage of labor in the rubber works for this and other non-essential goods.

RUBBER SUBSTITUTE.

In recent correspondence I referred to an impending famine in substitutes, owing to the failure of supply of vegetable oils. This contretemps, however, seems to have been averted, as rubber manufacturers are still able to get fair supplies. The modern method of neutralizing any free acid by addition of alkalies or alkaline earths, of course increases the weight of substitutes obtainable from a given weight of oil, and it is not surprising that under present conditions the amount of mineral matter thus introduced for this specific purpose shows a tendency to increase. I am referring now to ordinary oil substitute. We have also on the market some special substitutes containing much larger amounts of some inert mineral matter. I fail to see the advantage of buying them, unless the price paid is pro rata to their organic matter content. If the full price of ordinary substitute is paid, it seems to be one of those cases not uncommon in the rubber trade, where the price paid depends largely upon the degree of credulity with which the vaunted virtues of the particular material are received. With regard to the use of oil substitute the general position is abnormal. For one thing, we

have first-quality rubber at 48 cents per pound, and substitute at 18 or 20 cents, so that the inducement to its use is by no means so strong as when rubber was higher and substitute half its present price. Again, the proofing works, which have always been the largest consumers, are now very largely and in some cases entirely engaged on government work in which the use of substitute is barred. There is now little opportunity for the manufacture of the cheap waterproof clothing in which so much substitute commonly masquerades as rubber. A large quantity of substitute has always been used in cheap goods of this sort in preference to mineral matter, because of the suppleness it gives to the goods. As this class of work has never attained the dimensions in America that it has in Britain, and vice versa, as regards the manufacturer of galoshes, we have here an explanation of the greater use of substitute in Britain than in America, as also of the larger use of reclaimed rubber in America than in Britain. With the present stupendous army requirement in America the position is of course materially altered, and as some at least of the American army clothing specifications call for the use of substitute, we may take it that its use will be more general in American practice than it has been in the past. I may remark in conclusion that this paragraph was written before I had read the interesting article on rubber substitute by André Dubosc in the July issue of THE INDIA RUBBER WORLD. At present we hear only of white and brown substitutes, but I can remember the time when white substitute was called Scott's and brown substitute was always called French substitute, as it was only procurable from Lufbury & Chardonnier, whose works were at Chauny.

BITUMINOUS BODIES.

That versatile journal of America, "Metallurgical and Chemical Engineering," which is rather fond of changing its title, has also had an article on rubber substitutes, by Andrew H. King. I have read with special interest the portion relating to asphaltic materials, which are better understood as regards use with rubber in America than in Europe. During the last year or so, presumably owing to shipping difficulties, there has been difficulty in getting supplies of M R or other American bodies of like nature, and various substitutes have been tried. England has plenty of cheap pitch, but it is not at all popular in the rubber trade, owing to its smell when heated. Moreover, it contains varying proportions of free carbon, which affect its tenacity as a binding material. The scarcity of M R, and also of that popular body petroleum pitch, has led to experiments being made to improve the properties of coal-tar pitch so as to enable it to be used with rubber. These experiments, however, as far as I am familiar with them, have not had any success, mainly, I think, because the new products still retained the familiar smell. Mr. King draws attention to the fact that M R containing Gilsonite combines with sulphur and only dissolves to a limited extent in the ordinary solvents used in rubber analysis, thus making impossible a correct estimate of the rubber per cent. I am not sure that this applies only when Gilsonite is present. Anyhow, the whole subject of the analysis of rubber containing asphaltic bodies is a complicated one, and sympathy is due to the chemist who undertakes such work light-heartedly, unless he has had previous experience. Much the same may be said of the analysis of these asphaltic bodies alone. It is by no means easy to say whether one sample is as good as another, or whether deliveries are up to sample. Too much reliance should not be laid on analytical results in the case of material of this sort, and at

any rate it is useless to expect a reply by return mail. The subject of artificial asphalts is attracting much attention at the present time, though not specially in connection with the rubber industry, and we seem to be on the eve of developments likely to prove of considerable commercial importance.

NEW WATERPROOFING WORKS.

The Fabric Rubber Co., Limited, has been registered with a capital of £25,000, the directors being M. F. Frankenburg, S. T. Rowe, and H. Standring. These names will at once suggest to

British readers familiar with the proofing trade that I. Frankenborg & Sons, Limited, is in it. This is the case, the new works being really an offshoot of the well-known Salford firm for the manufacture of goods mainly for government requirements, though the company will continue in business after the war. The premises consist of the new buildings recently erected by the waterproofing firm of Ferguson Spicer and Co. at Fadswaite, near Manchester, the change of ownership having been effected before the latter firm had occupied the new premises.

Miscellaneous Foreign Notes.

FRENCH NOTES.

RUBBER AT THE COLONIAL AGRICULTURAL CONGRESS AT PARIS.
FURTHER details concerning the decisions made at the Rubber Section of the Colonial Agricultural Congress, mention of which was made in a recent issue of THE INDIA RUBBER WORLD, have just been received.

At the second sitting the principal question discussed was that of the creation of a crude rubber market in France. The unanimous opinion was that at the conclusion of hostilities, a market for crude rubber should be established either at Paris or at one of the large ports.

With regard to the creation of a Technical Bureau for Rubber at Marseilles, the Section considered that such an organization was a valuable accessory to a rubber market and further requested that:

(1) French shipping companies lower their freight rates on imports to correspond with charges of foreign companies;

(2) The facilities of the large ports be improved in order to decrease costs of transit, maintenance, storage, etc.

(3) Railroad companies regulate their tariff from the ports so as to favor both the importation of rubber into France and its exportation from the country.

At subsequent sittings, *Hevea* cultivation in Cochin China was the main topic. In a recent issue of the "Annales des Planteurs de Caoutchouc de l'Indochine," the exports from this colony during the year 1917 amounted to 977,879 kilos, or a total of about 1,006 tons, when 28,190 kilos of dry rubber, which could not be shipped for lack of freight, is included.

After some preliminary discussion the Section expressed the desirability of passing liberal laws regarding the alienation of rubber lands in Cochin China and recommended that all possible measures be taken to hasten the issuance of concessions. It further suggested that the utmost should be done, particularly in Indo-China, to complete and develop roads to facilitate the opening up of the immense territories suitable for rubber cultivation. Finally the need for the speedy creation of laboratories for research in the principal colonies, especially in Indo-China, was urged.

At the final sitting, the need was shown for a more favorable fiscal policy with regard to wild rubber in Africa, so as to give local producers a better chance against competitors in other parts of the world.

CONSUMPTION OF RUBBER DURING 1917.

During 1917 French rubber manufacturers consumed a total of 19,731 tons of rubber, comprising 4,432 tons of Pará and other Brazilian grades; 8,549 tons of first latex crêpe, and smoked sheet; 4,501 tons of brown plantation crêpe, and 2,247 tons of Congo rubber and similar sorts. At the same time French colonies produced a total of about 7,000 tons of rubber, including 1,000 tons of plantation rubber from Indo-China; 3,000 tons of French West African sheets and strings; 1,200 tons of French East African Upper Congo black; 700 tons of Congo red; 600 tons of inferior grades and 500 tons of rubber from vines and similar plants.

Of this quantity the local industry used only 3,247 tons, in-

Foreign Notes.

cluding approximately 1,000 tons of Indo-China plantation rubber, so that 3,753 tons of African grades were yet to be placed.

M. Jung, president of the Rubber Syndicate, considers that if the French rubber men would substitute the African rubber for brown crêpe, the whole output of the French colonies could be utilized in France. He advocated that efforts should be made towards this end, both by the manufacturers and producers, the former by employing the rubber, and the latter by improving their product.

IRISH TRADE IN RUBBER GOODS.

Recently published returns of Irish trade during 1916 show that the imports of rubber goods totaled 2,978,752 pounds, value \$3,901,966, against 2,818,928 pounds, value \$3,076,156, in 1915. Gutta percha imports were 32,256 pounds, value \$14,434. There was a decrease in the figures for electric cables, which fell from 2,650,704 pounds, value \$2,275,610 in 1915, to 1,688,176 pounds, value \$1,754,497. Exports of rubber goods are given as having amounted to 1,906,240 pounds, value \$2,497,046. The quantity of electric cables exported was 173,376 pounds, value \$180,187.

ITALIAN ASSOCIATION OF MANUFACTURERS OF RUBBER, CABLES, ELECTRIC CONDUCTORS, ETC.

It is announced that on July 3, 1918, the above association was formed by fourteen Italian firms, which employ about 20,000 operatives and have an output valued at several hundred millions of lire per annum. (A lira = \$0.193, par.)

The object of the association is the development of the rubber and electric-conductor industries in Italy by the study of all questions affecting their expansion in Italy and abroad.

Senator G. B. Pirelli is the president, while the vice-presidents are Comm. Ing. V. Tedeschi, of the S. A. Ing. B. Tedeschi, of Turin, and Ing. Romola Pola, of the Società Piedmontese Industria Gomma e Affini, of Moncalieri.

SUCCESS OF DANISH RECLAMING COMPANY.

The "Berlingske Tidende," published at Copenhagen, Denmark, commenting on the expansion of the Dansk Afvulkaniserings-fabrik A/S, at Kjøge, states that these works employed only 10 men in 1908, but now employ over 200. It seems that this factory is the only one in Denmark going ahead at full capacity day and night, and it is claimed that the plant, due to a special method of devulcanizing, has supplied all the Swedish and Norwegian rubber factories during the war. Six tons of old galoshes have been imported per day.

SOVIETS NATIONALIZE RUSSIAN RUBBER INDUSTRY.

A Russian official dispatch has been received in London, announcing that all important industrial enterprises within the jurisdiction of the Soviet Government have been nationalized by a decree of the Government Council. Among the industries which are now in the hands of the Government are the rubber, metallurgic, textile, electrical, explosive, wood, tobacco, glass, and leather trades.

Municipal undertakings, whether in use or in the course of construction, will come under the provisions of the order.

RUBBER AND RUBBER GOODS FOR SWEDEN.

Under the terms of the new commercial treaty, recently signed by the Allies and Sweden, rubber and rubber goods, foodstuffs, and numerous other materials necessary for Sweden's economic life, are to be exported to Sweden by the Allies in return for 400,000 tons of deadweight shipping, 2,000,000 tons of iron ore, and other Swedish goods, on suitable credit terms during the continuance of the present unfavorable monetary exchange. This pact amounts to a virtual acceptance by Sweden of the Allied blockade, and is expected to diminish greatly the sending of supplies to Germany.

MICANITE MANUFACTURED IN SWEDEN.

John R. Rettig & Co., Stockholm, Sweden, has begun the manufacture of micanite, an electric insulating material consisting of mica cemented together under pressure with an india rubber compound. Before the war Sweden imported all micanite from Germany and England.

DUTCH FIRM CHANGES NAME.

Carel and Jacques Kan, Doetinchem, Netherlands, have taken over the business in rubber goods and allied articles from their father, who traded as Kan & Co. The firm will henceforth be known as Kan & Kan.

RUBBER IN GERMANY.

A correspondent of the "Times Trade Supplement" submits an interesting analysis of advertisements in the principal German newspapers during the first three months of this year.

In general, rubber appears to be seldom advertised, and then only in the form of rings for mineral water bottles. In January some offers of Pará rubber appeared in a dentistry paper, the price being about \$71.75 a pound. In April, an advertiser asked for: "One or two dozen new or second-hand tennis balls. High price given."

RUBBER SHORTAGE AFFECTS GERMAN GAS MASK SUPPLY.

Recent press dispatches from Edwin L. James, with the American Army in France, state that Germany is having trouble in supplying troops with gas masks because of the rubber shortage. Leather as a substitute for rubber in the face mask is unsatisfactory. Indeed, Germany is finding gas warfare a terrible boomerang.

GERMANY TO RECEIVE RUBBER FROM FINLAND.

An Amsterdam dispatch states that under a commercial agreement with Finland, Germany is to receive, among other much-needed materials, old stocks of rubber. Obviously, these stocks must be so small, however, that the German rubber shortage will remain relatively unchanged.

BOLIVIAN RUBBER TRADE CONDITIONS.

The British vice-consul at Riberalta, Bolivia, reports that on account of the depression in the rubber trade, the Beni district is passing through a crisis. It seems that the rubber year which ended March 31, 1918, was very unsatisfactory. Although in normal times prices would have afforded a margin of profit, under present circumstances they resulted in loss. Local quotations ranged from 60 cents to 64 cents per pound for fine rubber, and from 32 cents to 36 cents per pound for caucho. As a result of this acute situation, the largest firm of exporters of rubber from the Beni district recently received instructions from its London headquarters to withhold the balance of its export until more favorable times return.

During the quarter January-March, 1918, German firms appear to be continuing business under increased difficulties, their greatest handicap being the securing of sufficient supplies of clothing, foodstuffs, etc., for the workers on their rubber estates

Although the possession of quantities of old stock enabled the Germans to maintain themselves for some time, it appears from reports of the larger allied commercial houses here, that the financial position of enemy firms is now precarious.

As to the internal trade of Bolivia, which is receiving more attention because of restricted imports, this is at present controlled by a combination of German firms whose monopoly is practically complete in the territory through which the river Mamoré provides the means of communication.

A freight and passenger service has just been inaugurated, connecting Guajara Mirim, at the terminus of the Madeira-Mamoré railway, with the port of Santa Cruz, in opposition to the transport services provided by two German firms. It is believed that the new enterprise will help to break the German monopoly.

THE NETHERLANDS INDIES RUBBER GOODS FACTORY, BANDONG.

This enterprise was begun in March, 1917, and gradually expanded so that whereas only a few workmen were employed at the outset, their number was 80 at the end of the company's first year. Production increased proportionately, and a reasonable profit is expected for the coming year. A second and third series of shares were issued, amounting to about \$80,000, to finance necessary expansion and a good stock of supplies. The labor consists of natives who have shown themselves apt pupils, but rather prone to absent themselves from the factory as soon as they receive promotion.

THE SOUTH AFRICAN RUBBER MANUFACTURING & TYRE CO., LIMITED, IN NATAL.

The South African Rubber Manufacturing & Tyre Co., Limited, Johannesburg, maker of mechanical rubber goods, has ac-



PRESENT FACTORY OF THE SOUTH AFRICAN RUBBER MANUFACTURING & TYRE CO., LIMITED.

quired a large block of land adjoining the Howick Falls in Natal, together with the power rights, and will erect a rubber factory on the site. The height of the falls is 364 feet and they are at about two hours' railway journey from Durban.

SINGAPORE RUBBER FACTORY TO HAVE AMERICAN MACHINERY.

The Singapore Rubber Works (Nederlandsche Gutta-Percha Maatschappij), 95 Anna Pavlava street, The Hague, Netherlands, is planning to purchase in America, rubber machinery, chemicals, and other supplies. J. P. M. Keuls, a representative of the company, is now in America for this purpose and will continue his trip to Soerabaya.

Recent Patents Relating to Rubber.

NO. 1,271,547. Shoe tree with inflatable bag. F. X. Delaney, Philadelphia, Pennsylvania.
1,271,597. Joint for fixing elastic tubes upon metal pipes. M. A. Mazade, Paris, France.
1,271,686. Spring wheel with rubber tread. J. Erdélyi, Rayland, Ohio.

THE UNITED STATES.

ISSUED JULY 9, 1918.

1,271,707. Combination rubber and leather footwear. E. Heiser and P. Bindle, Berlin, Ontario, Canada, assignors to The Goodyear's Metallic Rubber Shoe Co., Naugatuck, Connecticut.
1,271,826. Stamping device with elastic printing disk. F. E. Anderson, Brooklyn, New York.
1,271,843. Method of manufacturing rubber footwear. C. E. Bradley, assignor to Mishawaka Woolen Manufacturing Co.—both of Mishawaka, Indiana.
1,271,880. Tire and method of manufacture. G. F. Fisher, Roselle, New Jersey, assignor to The Hartford Rubber Works Co., Hartford, Connecticut.
1,271,936. Wheel with demountable rim. L. H. Perlman, New York City.
1,271,957. Tread band for pneumatic tires. W. F. Sprengnether, St. Louis, Missouri.
1,271,985. Tire carcass construction. A. O. Abbott, Jr., assignor of one-half to W. B. Norton—both of Detroit, Michigan.
1,272,058. Suspension patch for balloons. H. T. Kraft, assignor to The Goodyear Tire & Rubber Co.—both of Akron, Ohio.
1,272,098. Boot or shoe heel with rubber insert. J. P. Reily, St. Louis, Missouri.
1,272,122. Vehicle wheel with pneumatic tubes. G. Schadée, assignor by mesne assignments, of two-thirds to E. G. Gallagher and one-third to A. Schadée—all of New York City.
1,272,134. Tire armor having layers of vulcanized fabric combined with wire fabric.
1,272,143. Heel-protector for rubber heel. T. H. Sullivan, Sidney, Ohio.
1,272,161. Cushioned wheel. P. L. White, McCormick, South Carolina.
1,272,162. Hide and leather-working machine having reciprocating bladed bar with blades cushioned with rubber. R. F. Whitney, assignor to Whitney Machine Co.—both of Winchester, Massachusetts.
1,272,213. Demountable rim for tires. E. P. Calvin, Sardinia, Ohio.
1,272,215. Spring tire. C. A. Chalone, Aberdeen, Maryland.
1,272,223. Arch-supporting shoe with inflatable cushion between middle and inner soles. T. Coffey, West Tulsa, Oklahoma.
1,272,241. Spinning box having hard-rubber body. C. A. Ernst, assignor to The Viscose Co.—both of Marcus Hook, Pennsylvania.
1,272,247. Jar for submarine and other batteries. R. Ford, Philadelphia, Pennsylvania.
1,272,300. Resilient wheel. M. A. Meyers, Kane, Pennsylvania, assignor of 99/200 to 52 different assignees, names only given, without addressees.
1,272,309. Aviator's helmet with expandable head-band and having front section and chin-pad adjustable by means of elastic straps. J. Paupa, assignor to Thos. E. Wilson & Co.—all of Chicago, Illinois.
1,272,329. Pneumatic abdominal support. R. S. Carling, Los Angeles, California.
1,272,332. Electro-thermal garment having three plies detachable from each other for cleansing purposes. B. R. and P. E. Charles, Victoria, California.
1,272,333. Aerial mine having fuse-bomb-containing gas-bag, etc. R. J. Daly, Philadelphia, Pennsylvania.
1,272,342. Demountable rim for tires. O. Neal, Fremont, Michigan.

ISSUED JULY 16, 1918.

1,272,351. Emergency auto tire. C. W. Albrecht, Jr., Schleisingerville, Wisconsin.
1,272,429. Waistband with elastic webbing insert. M. L. Heller, Brooklyn, New York.
1,272,467. Demountable rim for tires. B. B. Leustig, Cleveland, Ohio.
1,272,476. Tire of carcass construction having continuous coiled spring within. F. H. Lopez, Cummington, California.
1,272,576. Resilient tire. L. P. Thompson, Minneapolis, Minnesota.
1,272,577. Truss. J. I. Throckmorton, Clarkburg, Ohio.
1,272,602. Resilient wheel. S. C. Barr, Chillicothe, Ohio.
1,272,619. Yieldable tire filling. J. G. Campan, assignor of one-fourth to C. C. Groli—both of Monroe, Michigan.
1,272,664. Tire with rounded central tread portion for carrying load when inner tube is inflated, and auxiliary treads for carrying it when inner tube is deflated. J. W. Hummel and F. W. Uhlde—both of Philadelphia, Pennsylvania.
1,272,684. Dress shield and process of manufacture. R. Levi, New York City.
1,272,697. Fountain pen with compressible reservoir. F. H. Mooney, Hinsdale, Illinois, assignor to The Conklin Pen Manufacturing Co., Toledo, Ohio.
1,272,706. Union garment having elastic suspender inserted in the back. G. W. Pease, Pittsfield, Massachusetts.
1,272,731. Fountain pen. H. J. Upton, Medford, Massachusetts.

1,272,742. Combined eye-dropper, syringe and medicine-holder, having soft rubber closure for nozzle. H. A. Weguelin and R. A. Phelan—both of St. Louis, Missouri.
1,272,852. Spring wheel. W. H. Robinson, assignor to G. H. Brown—both of Brooklyn, New York.
1,272,920. Tire supporting rim for vehicle wheel. M. Crowley, Tuckerton, New Jersey.
1,273,032. Tire core. D. A. Clark and C. E. Lowe, both of East Cleveland, assignors to The Clyde E. Lowe Co., Cleveland—all in Ohio.
1,273,046. Tire-tread construction. H. W. Dyer, East Orange, New Jersey. (Continuation in part of previous application.)

ISSUED JULY 23, 1918.

1,273,124. Tire repair vulcanizer. C. W. and W. J. Alter—both of Hagerman, New Mexico.
1,273,135. Tire shoe. G. Bergkvist, Mosquero, New Mexico.
1,273,175. Resilient shoe heel. F. A. Nolan, St. Paul, Minnesota. (Original application divided.)
1,273,446. Protective liner for pneumatic tires. R. L. Belton, Dayton, Ohio.
1,273,549. Hydroaeroplane. T. Sloper, Devizes, England.
1,273,550. Supporting device. H. Stamp, Philadelphia, Pennsylvania.
1,273,553. Parachute. R. H. Upson, assignor to The Goodyear Tire & Rubber Co.—both of Akron, Ohio.
1,273,640. Demountable rim for tires. R. McClure, assignor to H. G. Barus—both of Gilman, Montana.
1,273,670. Cartridge-feeding belt for machine guns, having warp of rubber threads. J. G. C. Quérion and J. Courbon, St-Etienne, France.
1,273,687. Life-preserved with inflatable sacks. F. Stebbing, Washington, District of Columbia.
1,273,731. Pad for horses' hoofs and shoes, with lower rubber tread portion and an upper composite rubber and woven fabric top. F. R. Button, assignor of one-half to G. W. Dunn—both of Scranton, Pennsylvania.
1,273,739. Corset with elastic abdominal portions. L. A. Cirillo, New York City.
1,273,792. Protective tread-covering for tires. J. Laube, Deer Island, Oregon.

ISSUED JULY 30, 1918.

1,273,813. Pneumatic spring system for vehicles, including air-container. R. Bernat, Bordeaux, France.
1,273,964. Pneumatic automobile tire. H. A. Webb, Hamden, Conn.
1,274,174. Hollow rubber article and method of manufacture. J. J. Lee, Brooklyn, assignor to A. Behrend and J. Rothschild, co-partners as Behrend & Rothschild, New York City—all of New York.
1,274,237. Tire and means of attachment. J. Boryszewski, Forks, N. Y.
ISSUED AUGUST 6, 1918.
1,274,437. Stopper for hot-water bottles, etc. E. V. Myers, East Orange, N. J., assignor to A. Schrader's Son, Inc., Brooklyn, N. Y.
1,274,445. Window washer and wiper. J. G. Randall, assignor of one-half to J. T. Shepherd—both of Dallas, Tex.
1,274,457. Rubber reducing-corset. G. E. Schenck, East Rutherford, N. J., assignor to C. M. Davis, New York City.
1,274,734. Revolving rubber heel with means for attachment. V. F. Maliszewski, Detroit, Mich.
1,274,853. Rubber heel. F. S. Carr, Newton, Mass.
1,274,883. Combined pneumatic and cushion tire. L. Hofmeister, Milwaukee, Wis.
1,274,892. Abdominal belt. A. B. Kendrick, East Orange, N. J., assignor of one-half to J. R. Kendrick Co., Inc., Philadelphia, Pa.
1,274,922. Tap sole of combined vulcanized fiber, leather, and rubber. F. Marsh, Leeds, assignor of one-third to W. Hey and one-third to J. W. Meadowcroft, both of York—all in England.
1,274,983. Windshield cleaner. C. A. Bridgewood, Westwood, N. J.
1,275,005. Webbed swimming glove. J. W. Eckman, Decatur, Ill.
1,275,033. Pneumatic-tire valve. W. C. Huntoon, Providence, R. I.
1,275,069. Toe-box inserter. C. Mikkelsen, Beloit, Wis.
1,275,109. Vehicle-wheel rim. J. H. Wagenhorst, Akron, O., assignor to The B. F. Goodrich Co., New York City.

ISSUED AUGUST 13, 1918.

1,275,199. Tire-tread protector. C. W. Bain, Norfolk, Va.
1,275,306. Inflatable pneumatic support for stretchers and beds. M. W. Rosenshine, San Francisco, Cal.
1,275,416. Tire-valve control. W. S. Gedney, Belleville, N. J.
1,275,523. Pneumatic fabric tire and process of manufacture. F. A. Bragg, Springfield, Mass.
1,275,590. Dental plate. W. M. Norwood, Greenville, S. C.
1,275,633. Tire protector. G. B. Waite, New York City.
1,275,634. Pneumatic-tire shoe. G. B. Waite, New York City.
1,275,647. Inflatable life-belt. S. P. Bjerre, Chicago, Ill.
1,275,727. Pneumatic water-skate. M. Niec, assignor of one-half to J. Kolaczynski—both of St. Catharines, Ontario, Canada.
1,275,746. Airship with gas-containing envelope. J. E. J. Rainey, Dallas, Tex.

THE DOMINION OF CANADA.

ISSUED MAY 31, 1918.

184,129. Tire with resilient core. O. J. Hicks, Centerburg, O., U. S. A.
 184,137. Armored pneumatic tire. I. L. Leo, Toronto, Ont.
 184,139. Tire. J. Lorenz, Milwaukee, Wis., U. S. A.
 184,140. Shoulder brace. H. V. A. Loring, Chicago, Ill., U. S. A.
 184,141. Tire. F. Lotter, Elkton, Mich., U. S. A.
 184,145. Cushion for wheels. C. S. Martin, Washington, D. C., U. S. A.
 184,186. Tire rim. H. Stinemets, Calgary, Alta.
 184,222. Liner for pneumatic tires. The Dunlop Tire and Rubber Goods Co., Limited, assignee of T. A. Burns—both of Toronto, Ont.
 184,228. Vulcanizable tire patch. The Marvel Accessories Manufacturing Co., assignee of S. I. Rose—both of Cleveland, O., U. S. A.
 184,440. Resilient tire. O. A. Kondelke, Cicero, Ill., U. S. A.
 184,518. Inner tube. S. Johnstone and W. E. Doran, co-inventors—both of St. Catharines, Ont.
 184,589. Pneumatic wheel. W. T. Newman, Vancouver, B. C.
 184,597. Waterproof stocking with integral vulcanized rubber interlining. A. Richard, Hamilton, Ont.

THE UNITED KINGDOM.

ISSUED JULY 17, 1918.

115,748. Diver's dress with rubber collar securing helmet to dress. R. H. Davis, 187 Westminster Bridge Road, London.
 115,756. Webbed glove for swimming. C. E. A. and E. A. E. Holdsworth—both of 24 St. Ann's Villas, Holland Park, Kensington, London.
 115,770. Box-toe stiffener for boots, etc., of woven wire fabric embedded in rubber compound. J. H. Ordway, 77 Fuller street, Brookline, Massachusetts, U. S. A.
 115,784. Boot-sole with backing of rubber, rubberoid, etc. W. V. Brierley, Park Dale, New Hereford Road, Abergavenny, Monmouthshire.
 115,788. Sole or heel protector of raised rubber on canvas backing. F. J. Wood, 3 Raws street, Bank Parade, Burnley, Lancashire.
 115,841. Bicycle saddle with inflatable cushions. A. P. van Leuven, 41 Frankenslag, The Hague.
 115,912. Protective armor for cars, "tanks," aircraft, motorboats, etc., composed of coir fiber fabric and rubber, or balata vulcanized together. Coir Tyre Co., 56A Mosley street, and G. D. Rose, 14 Albert Park Road, Lower Broughton, Salford—both in Manchester.
 115,913. Fabric for driving belts, composed of layers of fabric and rubber. E. B. Boughton, Doddington Road, Swallowback, Lincoln.
 115,914. Demountable rim for tires. J. J. Foley, 46 Kearny street, San Francisco, California, U. S. A.

ISSUED JULY 24, 1918.

115,945. Tire cover with gable-shaped tread. E. B. Killen, 27 Queen Victoria street, London.
 115,955. Elastic band for securing wearing apparel. W. Lee, 36 Haymerle Road, Peckham, London.
 115,990. India rubber driving belts. W. M. Angus, St. John's Works, Newcastle-on-Tyne, and G. Lunney, Ingleborough View, Benthall.
 115,993. Surgical appliances. E. Roddy, 108 West 61st street, New York City.
 116,001. Rubber-tired wheel for children's go-carts. W. H. Ball, 12 Terrace street, Hyson Green, Nottingham.
 116,014. Corsets with back lacing covered by elastic strip. M. Shaw, 1412 East 55th street, Chicago, Illinois, U. S. A.
 116,057. Artificial hands with rubber fingers stiffened with wire. J. J. Stubbs, City Road, Cardiff.
 116,079. Rectal syringe. H. Cotton, Avenue de la République, Aubervilliers, France.
 116,081. Sole for boots and shoes, having layers of vulcanized wood fiber, etc., with fabric backing secured to them by rubber solution. Société Française du Cuir Armé, 57 rue Alexandre Dumas, Paris.
 116,087. Oxygen-administering apparatus with rubber bags. L. Durieu, 38 Boulevard des Brotteaux, Lyons, and G. M. C. Aulanier, 22 rue des Prairies, Paris—both in France.
 116,093. Spring wheels with cover of balata, etc. A. Andersen, 4 Rosenkrantzgaten, Christiania.
 116,127. Veil with elastic gathering thread at edge. A. Burnet, 6 Well street, Jewin street, London.
 116,155. Soothing teats. J. H. Davis, 194 Bristol Road, Birmingham.

ISSUED JULY 31, 1918.

116,191. Rubber tapping knives. Guthrie & Co., 5 Whittington avenue, Leadenhall street, London. (H. J. V. Duncan, Port Dickson, Negri Sembilan, Federated Malay States)
 116,351. Surgical injection apparatus. M. Day, 8 Albemarle street, Clerkenwell, London.
 116,376. Respirators. F. E. Jackson, 22 Beech Road, Chorlton-cum-Hardy, Manchester.
 116,382. Apparatus for administering anesthetics. E. V. Tomey, 134 Birchfield Road, Handsworth, Birmingham.
 116,390. Cushion tire. E. B. Killen, 27 Queen Victoria street, London.
 116,405. Sole for boots and shoes, composed of layers of damp-proofed wood, vulcanized fiber, etc., glued together. C. A. Schleiner and A. Metzler—both of Wohlen, Aargau, Switzerland.

ISSUED AUGUST 8, 1918.

116,424. Breathing apparatus for divers, etc. H. Wade, 111 Hatton Garden, London. (Drägerwerk H. & B. Dräger, 53 Moislinger Alle, Lubbeck, Germany.)
 116,448. Pneumatic tire-pressure gage. J. M. Goewey, 801 Sutter street, San Francisco, Cal., U. S. A.
 116,534. Parachutes contained in flexible envelope. E. R. Calthrop, Eldon Street House, Eldon street, London.

116,607. Rubber solution container for tire-repair outfits. Dunlop Rubber Co., 14 Regent street, Westminster, and H. J. Dunn, 47 Kingsbury Road, Gravelly Hill, Birmingham.
 116,615. Waterproof cover for ladies' hats. W. D. L. Busby, School House, Clifton-upon-Dunsmore, Warwickshire.
 116,632. Revoluble rubber pad for heels, soles, and tips. T. C. Redfern, G. W. Richards, and Redfern's Rubber Works, Limited, Dawson street, Hyde, Cheshire.
 116,677. Means for attaching rubber tires to rims. W. T. G. Ellis, C. O. R. McLeod, 15 Cambridge street, Glasgow.

ISSUED AUGUST 14, 1918.

116,726. Hypodermic injector with rubber piston plug. R. G. J. McEntire, 23 Pembroke Park, Dublin.
 116,733. Suction appliances in dentures. S. J. Everett and A. Kirkman, Oakleigh, Duppas Hill Road, Croydon, Surrey, and H. O. Cottrell, 15 Charlotte street, London.
 116,798. Stopper for carbons, with rubber washer. British Dyes, Limited, and J. Turner, Turnbridge Chemical Works, J. Bruce, Wood Villa, Berry Brow, and J. D. Eastwood, 16 Batley avenue, Marsh—all in Huddersfield, Yorkshire.
 116,812. Rubberized fabric container for transporting and storing gas. A. C. Spencer, E. Allen, and E. G. Cole, 56A Highbury Grove, London.
 116,813. Blotting appliance with holding device of rubber. E. Howarth, Spring Field, Midgley, Luddenden Foot, Yorkshire.
 116,818. Flanged rubber sole for boots, etc. A. Dales, trading as A. Dales & Co., India Rubber Mills, Blake street, Stratford Road, Manchester.
 116,836. Hose coupling. E. Reddaway & Co. and J. Muskett, Cheltenham street, Pendleton, Manchester.

ISSUED AUGUST 21, 1918.

116,856. Boot-sole protector. F. J. Wood, 3 Raws street, Bank Parade, Burnley, Lancashire.
 116,872. Valve for feeding bottles. A. Jackson, Woodleigh, Temple Gardens, Golder's Green, London.
 116,913. Improvement in valve for rubber bag in straw-hat presses. A. H. Moseley and C. Macintosh & Co., Cambridge street, Manchester.
 116,975. Elastic cords for muscle exercisers. H. J. Wareham, 146 Blackfriars Road, London.
 116,986. Rubber-covered stoppers for vacuum flasks. A. W. Brunette, Golconde, Upper Court Road, Epsom, Surrey, and C. C. Scarborough, 15 Took's Court, Cursitor street, London.
 117,012. One-piece life-saving suit. P. Borgan, 1014 Hawthorne avenue, Portland, Ore., U. S. A.

ISSUED AUGUST 28, 1918.

117,063. Rubberized fabric container for transporting and storing gas. A. C. Spencer, E. Allen, and E. G. Cole, 56A Highbury Grove, London. (See patent No. 116,812.)
 117,093. Tire tread. T. Dunn, 63 Tierney Road, Streatham Hill, London.
 117,102. Eyelid retractor. H. Shanker, Civil Hospital, Delhi.
 117,119. Rubberized canvas aircraft cushioning device. T. Sloper, Southgate, Devizes, Wiltshire.
 117,133. Dental articulators with rubber-shod jaws. A. W. Fisher, Bryn Estyn, Whitchurch, Shropshire.
 117,148. Respiration modifier. J. Baer, 80 Holland Park, London. (P. Lassabiere; St. Hilaire, St. Mesmin, Loiret, France.)
 117,177. Inner-tube liner. J. B. Jeffries, trading as J. Benjamin, 3 John street, Llanelli, Carmarthenshire.

THE FRENCH REPUBLIC.

PATENTS ISSUED (WITH DATES OF APPLICATION).

486,768. (October 23, 1916.) Improvements in abdominal supporters such as belts. F. G. Baugatz.
 486,809. (September 7, 1917.) Jiffy Life Belt Manufacturing Co.
 486,824. (September 14, 1917.) Life-saving vest. H. L. Ziman.
 486,886. (September 19, 1917.) Improvements in vehicle wheels. H. Allen.
 486,925. (September 25, 1917.) Improvements in tires. G. A. Mortier.
 486,944. (December 9, 1914.) Improvements in wheels having inner pneumatic tires. J. Gonzalo and R. de Dampierre.
 487,044. (October 4, 1917.) Pneumatic tire protector. J. F. Bileotto.
 487,085. (October 8, 1917.) Wheel rims and tires. H. Rajlowich.
 487,096. (October 10, 1917.) Ball valve of rubber or other elastic substance. M. S. Reiley.
 487,137. (October 12, 1917.) Pneumatic hub for vehicle wheels. H. Schade van Westrum.

NEW ZEALAND.

ISSUED JULY 11, 1918.

38,792. Indoor game. J. S. Wearn, Christchurch.
 40,033. Combined hard and soft rubber packing for tubular connections. J. Fraser, "Arnprior" Rangers Road, Neutral Bay, and E. L. Ernest, Maroomba, Nelson street, Woollahra—both of Sydney, New South Wales.
 40,055. Rubber-pad attaching device for horseshoe. B. P. Gray, Ellangowan, Bishop's Road, Sutton Coldfield, Warwick, England.

TRADE MARKS.

THE UNITED STATES.

NO. 101,452. The word HAWK—golf balls. North British Rubber Co., Limited, Edinburgh, Scotland.
 107,788. Representation of a tire in ellipse with two parallel white stripes on tread portion—tire covers. Gates Manufacturing Co., Indianapolis, Ind.

110,118. The words PYE-MUSSELMAN with a representation of two crossed bayonets at each end and an oblong blank white space superimposed above the middle of the word—rubber or rubber-and-fabric pneumatic vehicle tires.

110,213. The words JIFFY-ALL—waterproof fabrics for protecting inner garments, etc. Jiffy-All Corp., New York City.

110,462. The word ALFCO—rubber-lined cotton-fabric hose. American La France Fire Engine Co., Inc., Elmira, N. Y.

110,463. The word ALFCO—respirating devices. American La France Fire Engine Co., Inc., Elmira, N. Y.

110,471. The word DEICO—rubber rings for fruit jars. The Deis-Fertig Co., Dover, O.

110,592. Representation of a negro running, with a turtle biting one heel, a fishing pond in the background, and the slogan underneath, "Won't turn loose for thunder"; above all, the words TURTLE GAFF—patches for repairing inner tubes of all kinds. Southern Turtle-Grip Co., Houston, Tex.

110,598. Representation of a notched pennant flying from a staff—rubber and composition hose, and rubber, leather, and composition belting and packing. Geo. B. Carpenter & Co., Chicago, Ill.

110,635. The word CONQUEROR—rubber hose and hose made of composition rubber or rubber and fabric. Voorhees Rubber Manufacturing Co., Jersey City, N. J.

110,654. The word VACUO—tire patches and liners. J. H. and G. L. Atwood, Inc., Boston, Mass.

110,815. The words DUO-TAX in script letters arranged in a semi-circle—leather or fabric belts for personal wear. Live Leather Belt Co., Inc., New York City.

110,867. The words WIN-THE-WAR—boots and shoes of leather, fabric, and rubber, combined. Beacon Falls Rubber Shoe Co., Beacon Falls, Conn.

110,916. The word POLAR—zinc oxide used as a filler for rubber goods. The American Metal Co., Limited, New York City.

111,061. The word BANNER—rubber and composition hose and rubber, leather, and composition belting and packing. Geo. B. Carpenter & Co., Chicago, Ill.

111,232. Representation of a shield upon which is superimposed a double outlined triangle with a pair of scales within and the letters G and H to the right and left of the apex—rubber boots and shoes, etc. Von Der Heyde & John, New York City.

111,234. Representation of a shield upon which is superimposed a double outlined triangle with a pair of scales within and the letters G and H to the right and left of the apex—rubber coats and various other articles of wearing apparel. Von Der Heyde & John, New York City.

111,289. The word INKTAB—fountain pens. Adams, Cushing & Foster, Inc., Boston, Mass.

111,290. The word ACFA enclosed within a modified ellipse suggesting the outline of a bathing cap—rubber erasers, rubber bands, fountain pens, etc. Adams, Cushing & Foster, Inc., Boston, Mass.

111,293. Silhouette of Ajax rolling a tire—rubber gums, namely: combination, combination tube, cushion, and tread. Ajax Rubber Co., Inc., Millbrook, N. Y.

111,294. Silhouette of Ajax rolling a tire—vulcanizing cement and air-drying pure-rubber patching cement. Ajax Rubber Co., Inc., Millbrook, N. Y.

111,325. The word VIVOR—golf balls. Wright & Ditson, Boston, Mass.

111,370. The word TUBO—puncture-sealing preparation for pneumatic tires. Tubo Manufacturing Co., Saint Louis, Mo.

111,688. The word ACCOFIBRO—fibrous heels and soles. The Acme Rubber Heel & Sole Co., Elyria, O.

THE DOMINION OF CANADA.

23,515. The word ADMYEA—garters, etc. Wagner & Brandon, 54 Aldermanbury, London, E. C., Eng.

23,543. The word GOODYEAR—pneumatic and solid tires, pneumatic tubes, tire accessories, hose, belting, packing, tubing, molded goods, cements, leather substitutes, rubber or composition heels and soles. The Goodyear Tire and Rubber Co. of Canada, Limited, Toronto, Ont.

23,545. The word COOLASTIC—handgases. Everlastik, Inc., Boston, Mass., U. S. A.

23,567. Representation of a geometric figure—rubber tires. The Brunswick-Balke-Collender Co., Chicago, Ill., U. S. A.

ARMY and NAVY AWARDS.

GENERAL ENGINEER DEPOT AWARDS.

THE following awards of mechanical rubber goods have been announced at the general engineer depot, United States army.

CORD, PACKING-HOUSE.—\$39, The B. F. Goodrich Rubber Co.

GASKETS, RUBBER.—6,000 pounds, \$0.25, Quaker City Rubber Co., Philadelphia, Pennsylvania.

PACKING.—Asbestos sheet: 2,000 pounds, \$0.75, Manhattan Rubber Manufacturing Co., Passaic, New Jersey.

SHIELDS, RUBBER.—75 pounds, \$0.80, The B. F. Goodrich Rubber Co., Akron, Ohio.

FIELD MEDICAL SUPPLY AWARDS.

The following awards of rubber sundries have been made by the field medical supply depot, Washington, District of Columbia.

APRONS.—35,000, \$0.55 $\frac{1}{4}$ each, L. C. Chase Co.

ATOMIZERS, HAND.—3,500, \$0.82 each, De Vilbis Manufacturing Co.

BANDS, ELASTIC, PURE GUM.—5,000 gross, \$0.16, The B. F. Goodrich Rubber Co.

BASINS.—25,000, \$0.55 each, United States Rubber Co.

BULBS.—20,000, \$0.0105 each, Tyer Rubber Co.

GLOVES.—8,000 pairs, \$0.25, Miller Rubber Co.

POUCHES FOR RUBBER GLOVES.—7,000, \$0.15 each, L. C. Chase Co.

STOPPERS.—250,000, \$0.52 per pound, F. A. Cigol Rubber Co.

SYRINGES.—Hard rubber, 8,350, \$0.20 each, Charles Schmid Co.; 20,000, \$0.30 each, Tyer Rubber Co.; rectal, 10,000, \$0.94 each, American Hard Rubber Co.

TOURNIQUETS AND BANDAGES.—2,500, \$0.75 each, Parker, Stearns & Co.

TUBES, STOMACH.—3,000, \$0.54 each, The B. F. Goodrich Rubber Co.

NAVAL SUPPLY AWARDS.

The following awards have been made for furnishing rubber goods for navy yards:

FERRULES, RUBBER.—135,000, \$4,156.65, Ohio Rubber Co., Cleveland, Ohio.

GASKETS.—Strip and sheet gum, \$103,278.20; 13,000 pounds, \$5,722, Hewitt Rubber Co., Buffalo, New York; molded rubber: 8,000 pounds, \$4,640; 300 pounds, \$183, New Jersey Car Spring & Rubber Co., Inc., Jersey City, New Jersey.

HOSE.—Rubber, steam, 3,000 feet, \$1,335, Hamilton Rubber Co., Trenton, New Jersey; rubber, wash deck, 40,000 feet, \$0.529, Hewitt Rubber Co., Buffalo, New York.

PACKING.—Compressed fiber sheet, 100,000 pounds, \$42,000; 16,000 pounds, \$6,720, The B. F. Goodrich Rubber Co., Akron, Ohio.

WIRE, RUBBER-COVERED.—21,000 feet, \$343.35, American Steel & Wire Co., Chicago, Illinois, and \$504.20, Bourn Rubber Co., Providence, Rhode Island.

NAVY EMERGENCY PURCHASES.

The following awards have been made by the bureau of supplies and accounts, Navy Department, for Navy emergency purchases:

BALLOONS, RED RUBBER.—115, \$37.50, Faultless Rubber Co., Ashland, Ohio.

CONDUCTORS, TWIN FLAT.—15,000 feet, \$9,675, Boston Insulated Wire & Cable Co., Epping, New Hampshire.

MANOMETERS.—20, \$345, Goodyear Tire & Rubber Co.

PARACHUTES, BASKET TYPE.—2, \$630, Goodyear Tire & Rubber Co., Akron, Ohio.

VALVES, GAS.—One 16-inch, \$123.70, Goodyear Tire & Rubber Co., Akron, Ohio.

PANAMA CANAL AWARDS.

The following awards have been made for furnishing supplies for the Panama Canal:

HOSE, WATER.—500 feet, \$292.50, Hamilton Rubber Co., Trenton, New Jersey.

TIRES.—30, \$1,947.46, Goodyear Tire & Rubber Co., Akron, Ohio; \$606.40, Century-Plainfield Tire Co., Plainfield, New Jersey.

CENSUS AND CONTROL OF THE PLANTATION RUBBER INDUSTRY.

THE August, 1918, issue of "The Times Trade Supplement," publishes an article by J. S. M. Rennie, which emphasizes the need for a compulsory census of all rubber plantations controlled by British subjects. The writer urges that the collecting of such statistical data is necessary in order that some controlling authority "should be in a position in times of stress and possible overproduction, so to control outputs as to prevent a collapse in the price of the commodity and the opportunity which any

such crisis would offer to powerful cliques (probably 'alien') to buy up a controlling interest."

Since no visible move has been made by the authorities to collect such figures, the writer has compiled from all the available hand-books from the various rubber-producing centers the following tables showing the location and domicile of all the known rubber plantations:

DOMICILED IN UNITED KINGDOM.

Location.	Acres.
Federated Malay States.....	586,883
Straits Settlements	109,500
Ceylon	179,695
South India	41,820
British Borneo	29,880
British Burma	24,620
South Sea Islands	5,000
Sumatra	98,000
Java	108,830
Dutch Borneo	5,100
	1,189,328

DOMICILED IN STRAITS SETTLEMENTS.

Location.	Acres.
Federated Malay States.....	20,270
Straits Settlements	40,000
Burma	1,770
Sumatra	6,055
Straits Settlements (private owners).....	10,000
Federated Malay States (private owners).....	20,000
	98,095

DOMICILED IN FEDERATED MALAY STATES.

Location.	Acres.
Federated Malay States.....	13,348
Federated Malay States (private owners).....	105,000
	118,348

DOMICILED IN CEYLON.

Location.	Acres.
Ceylon	40,000
Ceylon (private)	10,000
Federated Malay States.....	7,000
	57,000

DOMICILED IN SHANGHAI (BRITISH).

Location.	Acres.
Federated Malay States.....	30,000

DOMICILED IN HOLLAND AND NETHERLANDS EAST INDIES.	Location.	Acres.
Federated Malay States.....		5,000
Sumatra		120,000
Java		100,000
Sumatra (private)		10,000
Java (private)		20,000
Dutch Borneo		5,000
		260,000

DOMICILED IN FRANCE AND BELGIUM.

Location.	Acres.
Federated Malay States.....	20,000
Sumatra	60,000
Java	10,000
Cochin China	10,000
	100,000

DOMICILED IN UNITED STATES OF AMERICA.

Location.	Acres.
Sumatra	55,000

DOMICILED IN GERMANY.

Location.	Acres.
Sumatra	3,400

Total planted area..... 1,911,171 100

According to domicile, therefore, the percentage controlled by the different nationalities may be summed up as follows:

	Acres.	Per Cent.
British Domicile	1,492,771	or 79
Dutch Domicile	260,000	or 13½
French and Belgian Domicile	100,000	or 5½
United States of America Domicile	55,000	or 2½
German Domicile	3,400	or ½

Totals

But if the place where planted is considered, the control is vested as follows:

BRITISH.

Location.	Acres.
Federated Malay States and Johore	807,491
Straits Settlements	159,500
Ceylon	229,695
South India	41,820
British Borneo	29,880
British Burma	26,390

South Sea Islands	5,000
	1,299,786 (or 67 per cent)

DUTCH AND OTHERS.

Location.	Acres.
Sumatra	352,455
Java	238,630
Dutch Borneo	10,100
Cochin China	10,000
	611,385 (or 33 per cent)

When domicile and location are combined, the result is:

Location.	Acres.
British Empire	1,517,771 or say 80 per cent
Dutch and others	393,400 or say 20 per cent
	1,911,171

Calculating that this area will yield an annual crop of 380,000 tons of rubber about 1920, the distribution will be as follows:

BASED ON DOMICILE.

Location.	Tons
British Empire	281,000
Dutch Empire	75,000
France and Belgium	15,000
United States of America	8,000
Germany	1,000
	380,000

BASED ON ESTATE LOCATION.

Location.	Tons.
British Empire	255,000
Dutch East Indies, etc.	125,000
	380,000

BASED ON DOMICILE AND ANY LOCATION COMBINED.

Location.	Tons.
British	290,000
Dutch and others	90,000
	380,000

Unless some control is exercised, it is pointed out that enemy and neutral countries, will be able to obtain about 15 per cent of the estimated crop for 1920, if peace has ensued by that time, at the same price per pound as the United Kingdom and the Allies.

Furthermore, says the writer, if conditions permit plantation companies and the powerful American and British rubber goods manufacturers to plant *ad libitum*, the planted area ten years hence may easily be 4,200,000 acres, which at 375 pounds per acre per annum would give a total crop of 700,000 tons. And in the event that the demand is less by the smallest fraction than the supply, a serious drop in prices is foreseen, accompanied by an equally considerable fall in the market value of an acre of rubber. This circumstance would give a powerful clique backed by the large American, British, and French manufacturers, the chance to buy up control of the great bulk of plantation companies, and to regulate prices so that members of the trust would be able to undersell all manufacturers outside the clique.

ADVOCATE MINIMUM RUBBER PRICES.

The rubber planters of the Dutch East Indies have just started a campaign to secure the fixing of minimum prices for rubber and the licensing of its export. They also seek official assistance in an attempt to secure the cooperation of the planters in Ceylon and the Malay States. But while these efforts are being made in Java, the Selangor branch of the Federated Malay States Chamber of Commerce is launching a movement for the total exclusion from the Singapore market of rubber produced in the Dutch East Indies, during the war, or, if prohibition is impossible, for a special import tax of five per cent. It seems to be felt that the American Government should do nothing to assist the import of Dutch rubber to the detriment of Allied producers. The Planters' Association of Malaya has asked the British Government to induce other rubber-producing countries to limit their output, and it is pointed out that the British War Cabinet has adopted the principle of preferential trade within the Empire.

Review of the Crude Rubber Market.

Copyright, 1918.

NEW YORK.

CRUDE rubber imports for October, November and December have been fixed at 25,000 tons and will be allocated to rubber manufacturers according to the program promulgated September 22, by the War Trade Board, and published elsewhere in this issue.

PLANTATIONS.—Quiet market conditions have prevailed in this market during the past month, as consumers were generally satisfied with small lots sufficient for immediate requirements, and are awaiting new developments. Interest was lacking to a great extent in either stock afloat or for future shipment, and the scarcity of allocation certificates indicated that manufacturers were supplied.

About the middle of the past month considerable free rubber was offered by manufacturers who were overstocked, and sales of small lots were reported to have been made at prices ranging from 51 to 61 cents for Crêpe and 49½ to 60 for Ribs. Trading in allocation certificates was an unusual feature of the market.

The Far Eastern market received considerable attention from the manufacturers, relieving in a measure the distressed condition in that quarter. Quotations on October and November shipments of Crêpe varied from 35 to 40 cents, and on Ribs from 33½ to 38 cents during the month.

PARAS.—Upriver fine, for future shipment was quoted at 57½ to 60 cents, and coarse sold for 30½ to 31 cents. Upper caucho ball was placed at 30½ cents, and Cametá sold for 21 cents. A few lots of free Upriver fine were sold at maximum prices.

STATISTICS.—The United States plantation imports for August, 1918, were 15,153 tons, compared with 8,473 tons for the same month a year ago. Pará imports for August, 1918, were 1,760 tons, compared with 1,744 tons last year.

NEW YORK SPOT QUOTATIONS.

Following are the New York spot quotations, one year ago, one month ago, and September 28. Government option prices, c. i. f. New York are given in the last two columns.

PLANTATION HEVEA—	Free Rubber.		
	October 1, 1917.	September 1, 1918.	September 28, 1918.
First latex crêpe.....	67½ @	63 @	63 @
*Hevea first crêpe.....	67½ @	63 @	63 @
Amber crêpe No. 1.....	62 @	60 @	60 @
Amber crêpe No. 2.....	61 @	60 @	60 @
Amber crêpe No. 3.....	60 @	58 @	58 @
Amber crêpe No. 4.....	59 @	57 @	57 @
Brown crêpe, thick clean.....	59 @	60 @	60 @
Brown crêpe, thin clean.....	59 @	60 @	60 @
Brown crêpe, thin specky.....	55 @ 56 @	50 @	50 @
Brown crêpe, rolled.....	46½ @	44 @	44 @
Smoked sheet, ribbed standard quality.....	65½ @ 66 @	62 @	62 @
*Hevea ribbed smoked sheets.....			
Smoked sheet, plain standard quality.....	64 @ 64½ @	61 @	61 @
*Hevea plain or smooth smoked sheets.....			
Unsmoked sheet, standard quality.....	61 @ 62 @	60 @	60 @
*Hevea unsmoked sheets.....	61 @ 62 @	60 @	60 @
Colombia scrap, No. 1.....	47½ @	46 @	46 @
Colombia scrap, No. 2.....	46½ @	44 @	44 @

BRAZILIAN PARAS—

Upriver fine.....	68 @	68 @	68 @
Upriver medium.....	62 @	63 @	63 @
Upriver coarse.....	46½ @ 47 @	40 @	40 @
Upriver weak fine.....	58 @	56 @	50 @
Upper caucho ball.....	41 @	40 @	40 @
Islands fine.....	57 @	59 @	59 @
Islands medium.....	51 @	52 @	52 @
Islands coarse.....	29½ @	27 @	27 @
Cametá.....	30 @	28 @	28 @
Lower caucho ball.....	38 @	36 @	36 @
Peruvian fine.....	63 @ 64 @	67 @	67 @
Tapajos fine.....	65 @	60 @	60 @

	Free Rubber.		
	October 1, 1917.	September 1, 1918.	September 28, 1918.
AFRICANS—			
Niger flake, prime.....	28 @	28 @	28 @
Benguela, extra No. 1, 28%.....	27½ @	33 @	33 @
Benguela, No. 2, 32½%.....	34 @	29 @	29 @
Congo prime, black upper.....	56 @	48 @	48 @
Congo prime, red upper.....	52 @	48 @	48 @
Rio Nunez ball.....	65 @	55 @	55 @
Rio Nunez sheets and strings.....	65 @	55 @	55 @
Conakry niggers.....	64 @	55 @	55 @
Massai sheets and strings.....	64 @	55 @	55 @
CENTRALS—			
Corinto scrap.....	41 @	39 @	39 @
Esmeralda sausage.....	46 @	39 @	39 @
Central scrap.....	39 @ 40 @	39 @	39 @
Central scrap and strip.....	34 @ 36 @	35 @	35 @
Central wet sheet.....	27 @ 28 @	27 @	27 @
Guayule, 20% guarantee.....	32 @	35 @	35 @
Guayule, dry.....	32 @	48 @	48 @
MANICOBAS—			
Ceara negro heads.....	46 @	37 @	37 @
Ceara scrap.....	28 @	37 @	37 @
Manicoba (basis 30% loss washing and drying).....	39 @	36½ @	36½ @
Manicoba extra.....	35 @	35 @	35 @
Manicoba regular.....	31 @ 32 @	35 @	35 @
Mangabeira thin sheet.....	37½ @ 38 @	35 @	35 @
Mangabeira thick sheet.....	32 @	35 @	35 @
EAST INDIAN—			
Assam crêpe.....	60 @ 61 @	58 @	58 @
Assam onions.....	56 @	54 @	54 @
Penang block scrap.....	38 @ 39 @	37 @	37 @
BALATA—			
Block, Ciudad Bolívar.....	67 @ 68 @	71 @	71 @
Colombia.....	61 @	61 @	61 @
Panama.....	59 @	59 @	59 @
Surinam sheet.....	77 @	95 @	95 @
amber.....	97 @	97 @	97 @
PONTIANAK—			
Banjermassin.....	12 @	15 @	15 @
Palembang.....	12 @	16 @	16 @
Pressed block.....	19½ @ 20 @	25 @	25 @
Sarawak.....	14 @	14 @	14 @
GUTTA PERCHA—			
Gutta Siak.....	20 @	28 @	28 @
Red Macassar.....	2.00 @	3.00 @	3.00 @

*Rubber Association of America nomenclature.

RECLAIMED RUBBER.

While more active interest in reclaimed rubber was noted during the past month, the movement has not had any appreciable effect on the market. Now that the regulations governing crude rubber allocations for this quarter are known, there is reason in expecting that market conditions will improve. Prices have remained the same as a month ago.

NEW YORK QUOTATIONS.

SEPTEMBER 26, 1918.

Subject to change without notice.

Standard reclaims:			
Floating.....	.35 @	.40 @	.40 @
Friction.....	.40 @	.45 @	.45 @
Mechanical.....	.12 @	.13 @	.13 @
Red.....	.20 @	.25 @	.25 @
Shoe.....	.15 @	.15½ @	.15½ @
Tire, auto.....	.18 @	.18 @	.18½ @
truck.....	.13 @	.13½ @	.13½ @
White.....	.24 @	.25 @	.25 @

THE MARKET FOR COMMERCIAL PAPER.

In regard to the financial situation, Albert B. Beers, broker in crude rubber and commercial paper, No. 68 William street, New York, advises as follows:

The demand for commercial paper during September has been rather light, as for several months past, and the volume of rubber paper has also been small, the best names being quoted at 6½ to 6½ per cent, and those not so well known, 6½ to 7 per cent. With the drive for the Fourth Liberty Loan now on, the demand for paper will doubtless be very light.

COMPARATIVE HIGH AND LOW SPOT RUBBER PRICES.

	July.		
	1918.	1917.	1916.
Plantations:			
First latex crêpe	\$0.63 @ 0.60 1/2	\$0.65 1/2 @ 0.62 1/2	
Smoked sheet ribbed	.62 @ .59 1/2	.64 1/2 @ .61	
Paras:			
Upriver, fine	.68 @ .68	.66 1/2 @ .63 1/2	\$0.69 @ 0.74
Upriver, coarse	.40 @ .40	.46 @ .42 1/2	.41 @ .44
Islands, fine	.59 @ .59	.55 @ .50	.58 @ .62
Islands, coarse	.27 @ .27	.29 @ .27 1/2	.28 @ .30
Cameta	.28 @ .28	.30 @ .28	.32 @ .33

WEEKLY RUBBER REPORT.

GUTHRIE & CO., LIMITED, Singapore, report [August 1, 1918]: The weekly rubber auction held yesterday and to-day opened very quietly, and in the early stages not more than 48 1/2 cents per pound was obtainable for the best ribbed smoked sheet. Later in the day, however, additional buyers came in, and, though prices for the leading grades show a reduction as compared with last week, there was a good demand at the lower level. The top price for both fine pale crêpe and ribbed smoked sheet was 50 1/2 cents, being a decline of one cent upon crêpe and 2 1/2 cents upon sheet. Brown and good dark crêpes sold readily, but prices do not show any perceptible improvement. Of 1,170 tons catalogued, 628 tons were sold.

The following was the course of values:

	In Singapore per Pound. ¹	Sterling Equivalent per Pound Found in London.
Sheet, fine ribbed smoked	46c @ 50 1/2c	1/6 @ 1/7 1/2
Sheet, good ribbed smoked	36 @ 46	1 1/3 @ 1/6
Sheet, plain, unsmoked		
Crêpe, fine pale	48 1/2 @ 50 1/2	1 1/4 @ 1/7 1/2
Crêpe, good pale	38 @ 46	1 1/3 @ 1/6
Crêpe, fine brown	37 @ 40	1 1/3 @ 1/4 1/2
Crêpe, good brown	25 @ 36	1/ @ 1/3 1/2
Crêpe, dark	17 @ 25	9/4 @ 1/
Crêpe, bark	5 1/2 @ 24 1/2	6/2 @ 1/1 1/2
Scrap, virgin, and pressed	15 @ 19 1/2	9/4 @ 10 1/2
Scrap, loose	11 @ 22	8/3 @ 11 1/4

¹Quoted in S. S. currency.

SUMATRA RUBBER SHIPMENTS INCREASE.

Exports of plantation rubber from Belawan, Deli (Sumatra), increased from 16,418,000 pounds for 1916 to 28,949,000 pounds in 1917. The amounts were distributed as follows:

	1916. pounds	1917.
United States	8,340,000	20,136,600
Holland	28,000	
Great Britain	5,636,000	5,416,400
Canada	20,000	8,800
Straits Settlements	2,394,000	3,333,000
Hongkong		13,200
Japan		41,800
Totals	16,418,000	28,949,800

PLANTATION RUBBER EXPORTS FROM JAVA.

	June.	Six Months Ended June 30, 1918.	
To—		1917.	1918.
England	80,000	1,064,000	1,659,000
United States	1,488,000	7,923,000	4,162,000
Singapore	76,000	1,349,000	772,000
Japan		70,000	634,000
Other countries		51,000	9,000
Totals	1,644,000	2,143,000	9,768,000
From			
Batavia	925,000	975,000	5,680,000
Samarang	27,000	14,000	295,000
Soerabaja	692,000	1,149,000	3,793,000
Other ports		5,000	5,000
Totals	1,644,000	2,143,000	9,768,000
			10,872,000

CRUDE RUBBER ARRIVALS AT THE PORT OF NEW YORK.

In compliance with the Government's request, dates and names of vessels have been deleted in the following statistics:

[The Figures Indicate Weight in Pounds.]

PARAS.

Fine, Medium, Coarse, Caicho, Cameta. Totals.

August —. By the —— from Para and Manaos.	
Alden's Successors, Limited	54,639 3,625 16,243 22,125
H. A. Astlett & Co.	35,000 11,000
General Rubber Co.	17,920

August —. By the —— from Para.	
H. A. Astlett & Co.	36,000 12,500
Meyer & Brown	167,200

August —. By the —— from Para and Manaos.	
Pell & Dumont	43,381
Hagemeier & Brunn	67,200
General Rubber Co.	
H. A. Astlett & Co.	93,000 8,000 12,500 67,000
Meyer Bros.	138,200

September —. By the —— from Para and Manaos.	
Hagemeier & Brown	44,800 44,800
General Rubber Co.	
H. A. Astlett & Co.	108,000 25,000
Meyer & Brown	189,600

September —. By the —— from Para.	
Meyer & Brown	51,500 58,200

¹Including Medium.

ARRIVALS AT THE PORT OF NEW YORK.

PLANTATIONS.

TO NEW YORK.

POUNDS.

AUGUST —. By the ——, from Batavia:	
General Rubber Co.	729,300

AUGUST —. By the ——, from Colombo:	
General Rubber Co.	201,600
Meyer & Brown	44,800

SEPTEMBER —. By the ——, from Batavia:	
General Rubber Co.	358,200
Meyer & Brown	87,400

SEPTEMBER —. By the ——, from Colombo:	
General Rubber Co.	67,200

OVERLAND FROM PACIFIC COAST.

SEPTEMBER —. EX ——:	
J. T. Johnstone & Co.	85,190

SEPTEMBER —. EX ——:	
J. T. Johnstone & Co.	29,400

SEPTEMBER —. EX ——:	
J. T. Johnstone & Co.	49,200

AFRICANS.

SEPTEMBER —. By the ——, from Liverpool:	
Meyer & Brown	12,700

GUAYULE.

SEPTEMBER —. By rail from Eagle Pass:	
Continental-Mexican Rubber Co.	48,000

CRUDE RUBBER ARRIVALS AT PACIFIC COAST, AS REPORTED.

PLANTATIONS.

POUNDS.

SEPTEMBER —. By the ——, from Singapore:	
General Rubber Co.	\$ 269,500
Fred. Stern & Co.	56,000

CRUDE RUBBER ARRIVALS AT PACIFIC COAST AS STATED BY SHIP'S MANIFESTS.¹

SEATTLE AND TACOMA.

PLANTATIONS.

[Figured 135 pounds net to the case.]

TO AKRON, OHIO.

POUNDS.

AUGUST —. By the —— from Kobe:	31,860
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SEPTEMBER —. By the —— from Singapore:	
Firestone Tire & Rubber Co.	213,975
The B. F. Goodrich Co.	1,268,595
Swinehart Tire & Rubber Co.	133,380 1,268,595

¹Footnote.—The figures under this head and under Crude Rubber Arrivals at Pacific Coast as Reported, have been obtained from different sources; repetitions may, therefore, occur.

¹Footnote.—The figures under this head and under Crude Rubber Arrivals at Pacific Coast as Reported, have been obtained from different sources; repetitions may, therefore, occur.

POUNDS.		
SEPTEMBER — By the —	from Singapore:	
J. T. Johnstone & Co.	5,940	
Charles T. Wilson Co., Inc.	28,755	
Fred. Stern & Co.	46,305	
Goodyear Tire & Rubber Co.	5,400	
L. Littlejohn & Co.	249,730	
Mitsui & Co., Limited.	5,535	341,685
SEPTEMBER — By the —	from Singapore:	
F. R. Henderson & Co.	67,500	
Robinson & Co.	17,415	
Bank of Nova Scotia	7,155	
Goodyear Tire & Rubber Co.	8,910	
J. T. Johnstone & Co.	35,640	
Fred. Stern & Co.	22,815	
L. Littlejohn & Co.	47,655	207,090
SEPTEMBER — By the —	from Yokohama:	
Gravenhorst & Co.	6,210	
Fred. Stern & Co.	2,970	9,180

POUNDS.		
[Figured 135 pounds net to the case.]		
SEPTEMBER — By the —	from Soerabaya:	
L. Littlejohn & Co.	45,090	
Foel & Kelly	41,715	
The Rubber Association of America, Inc.	219,105	
Edward Maurer Co., Inc.	38,070	
Robinson & Co.	13,500	
Fred. Stern & Co.	20,925	
Mitsui & Co., Limited.	12,420	
The B. F. Goodrich Co.	87,210	
Goodyear Tire & Rubber Co.	17,145	495,180
(Short shipment, ex —)		
Robinson & Co.	270	
SEPTEMBER — By the —	from Hong Kong:	
Robinson & Co.	43,200	
Mitsui & Co., Limited.	19,305	62,505
SEPTEMBER — By the —	from Hong Kong:	
United States Rubber Co.	216,000	216,000

(Footnote.—The figures under this head and under Crude Rubber Arrivals at Pacific Coast as reported, have been obtained from different sources; repetitions may, therefore, occur.)

CUSTOM HOUSE STATISTICS.

PORT OF THE DISTRICT OF MASSACHUSETTS.—JULY, 1918.		
IMPORTS:	POUNDS.	VALUE.
Crude rubber:		
From—		
Straits Settlements	481,813	\$181,358
EXPORTS:		
Belting:		
To—		
Canada		\$310
Rubber boots:		
To—		
Canada—pairs	44	205
Rubber shoes:		
To—		
Cuba	1,719	\$1,690
Druggists' sundries:		
To—		
Canada		\$164
Cuba		2,835
Total		\$2,999
Other manufactures of india rubber:		
To—		
England		\$45
Canada		3
Newfoundland		272
Cuba		3,262
Total		\$3,582

PORT OF THE DISTRICT OF MICHIGAN.—JULY, 1918.		
IMPORTS:	POUNDS.	VALUE.
Rubber scrap	120,000	\$1,320
Manufactures of india rubber		3,488
Total		\$4,808
EXPORTS:		
Rubber scrap	110,081	\$3,867
Reclaimed rubber	2,086	240
Automobile tires		10,556
Other rubber tires		256
Belting Hose, etc.		4,542
Druggists' sundries		1,861
All other manufactures of india rubber		22,009
Total		\$43,331

STATISTICS OF CRUDE AND MANUFACTURED RUBBER AT THE PORT OF NEW YORK.

IMPORTS

July, 1918.

UNMANUFACTURED—free:

POUNDS. VALUE.

Crude rubber:		
From—		
England	127,690	\$64,744
Canada	25	15
Nicaragua	4,683	967
Salvador	438	219
Mexico	122,367	47,962
Brazil	280,3,042	879,430
Colombia	116,471	24,661
British Guiana	14,000	13,208
China	2,335	1,594
Straits Settlements	3,584,053	1,367,503
Other British East Indies	1,811,461	821,514
Dutch East Indies	320,655	136,474
Hongkong	2,500	1,344
Japan	223,225	124,909
Totals	9,133,203	\$3,484,632

UNMANUFACTURED—free:

POUNDS. VALUE.

Belting:		
From—		
Straits Settlements	784,815	\$70,379
Gutta percha:		
From—		
Straits Settlements	22,635	\$8,798
Balata:		
From—		
Panama	27,343	\$13,716
Brazil	7,429	5,226
Colombia	70,385	33,771
British Guiana	22,656	20,398
Dutch Guiana	41,554	31,422
Venezuela	11,146	5,416
Totals	180,513	\$109,949

Reclaimed rubber:

From—		
France	90,206	\$16,125
England	416,996	28,644
Panama	655	34
Cuba	52,337	2,714
Totals	560,194	\$47,517

TOTALS, UNMANUFACTURED, 10,681,360 \$3,721,275

MANUFACTURE—dutiable:

India rubber:		
From—		
France	\$165	
England	8,693	
Scotland	208	
Canada	20,295	
Mexico	15	
Japan	67	
Total		\$29,443

INDIA RUBBER SUBSTITUTES:

From—		
Straits Settlements	34,951	\$5,173

EXPORTS OF DOMESTIC AND FOREIGN RUBBER GOODS.

July, 1918.

MANUFACTURE—

POUNDS. VALUE.

Automobile tires:		
To—		
France	\$8,664	
Italy	585	
England	1,992	
Portugal	1,087	
Holland	1,051	
Panama	15,731	
Jamaica	10,685	
Trinidad	17,083	
Cuba	6,522	
Dominican Republic	81,262	
Argentina	3,202	
Bolivia	174,177	
Brazil	2,479	
Chile	20,556	
Colombia	48,175	
Pern	1,620	
Uruguay	790	
Venezuela	17,376	
Japan	14,913	
Australia	10,429	
New Zealand	10,952	
Other countries	21,628	
Total	\$526,389	

MANUFACTURE—

POUNDS. VALUE.

All other tires	6,011	\$1,488
Reclaimed rubber		
Belting		
Rubber boots		
Rubber shoes		
Druggists' sundries		
Other rubber manufactures		

Total \$1,010,227

EXPORTS OF FOREIGN MERCHANDISE.

July, 1918.

UNMANUFACTURED—

India rubber	184,639	\$107,148
Balata	61,857	43,530
Totals	246,496	\$150,678

July, 1918.

RUBBER STATISTICS FOR THE DOMINION OF CANADA.

The import and export figures by countries usually published in this table are withheld by the Canadian Government.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

July, 1918.

UNMANUFACTURED—free:

Rubber and gutta percha, crude caoutchouc or india rubber	1,521,192	\$731,604
Rubber recovered	132,682	27,571
Hard rubber, in sheets and rods	5,250	4,113
Rubber substitute	83,459	12,850
Rubber powdered and rubber or gutta percha waste	345,868	23,600
Rubber thread, not covered	4,668	6,855
Palata, crude	19	19
Chicle	548,243	255,638

MANUFACTURED—dutiable:

.....

Boots and shoes

Belting

Waterproof clothing

Hose, lined with rubber

Mats and matting

Packing

Fillets of cotton and rubber, not over seven inches wide, for card clothing

Tires of rubber for all vehicles

Rubber cement and all manufactures of india rubber and gutta percha—n. o. p.

Hard rubber, unfinished, in tubes, for fountain pens

Webbing, over one inch wide

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117

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176,253

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138,267

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424

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28,994

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138,767

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REEXPORTS.		
June, 1918		
UNMANUFACTURED—	POUNDS.	£.
Crude rubber:		
From—		
London	1,814,700	222,849
Liverpool	372,500	38,405
Totals	2,187,200	261,254
Waste and reclaimed rubber:		
From—		
Liverpool	22,400	600

UNITED KINGDOM RUBBER STATISTICS.

The import and export figures by countries usually published in this table are withheld by the British Government.

IMPORTS.		
July, 1918.		
UNMANUFACTURED—	POUNDS.	£.
Crude rubber	8,668,100	963,542
Waste and reclaimed rubber	2,200	25
Gutta percha	508,256	73,743
Totals	9,178,556	1,037,310
MANUFACTURED—		
Boots and shoes...doz. pairs	211	2,435
Automobile tires and tubes		24,712
Bicycle tires and tubes.....		1,510
Totals		28,657

EXPORTS.		
July, 1918.		
UNMANUFACTURED—	POUNDS.	£.
Waste and reclaimed rubber	782,800	17,747
MANUFACTURED—		
Waterproof clothing		40,762
Boots and shoes...doz. pairs	9,715	15,107
Insulated wire		4,113
Automobile tires and tubes		92,326
Motorcycle tires and tubes.....		31,035
Bicycle tires and tubes.....		18,515
Tires not specified.....		12,770
Other manufactures of india rubber		124,558
Total		339,186

EXPORTS—FOREIGN AND COLONIAL.		
July, 1918.		
UNMANUFACTURED—	POUNDS.	£.
Crude rubber	2,459,000	266,213
Gutta percha	30,688	3,093
Totals	2,489,688	269,306
MANUFACTURED—		
Boots and shoes...doz. pairs	117	257
Insulated wire		97
Automobile tires and tubes		3,338
Motorcycle tires and tubes		50
Bicycle tires and tubes		1,023
Tires not specified.....		98
Total		4,863

RUBBER STATISTICS FOR ITALY.

IMPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—	Two Months Ended February, 1918.	
	POUNDS.	LIRE.
India rubber and gutta percha—raw and reclaimed:		
From—		
Great Britain	193,600	.....
India and Ceylon	113,740	.....
Straits Settlements	185,680	.....
French West Africa	186,560	.....
Brazil	249,920	.....
Other countries	62,480	.....
Totals	991,980	4,058,100
Rubber scrap	36,960	16,800

MANUFACTURED—	India rubber and gutta percha—threads:	
	POUNDS.	LIRE.
From—		
Great Britain	4,180	.....
United States	5,500	.....
Totals	9,680	88,000

India rubber and gutta percha—sheets:	India rubber and gutta percha—hard rubber—tubes:	
	POUNDS.	LIRE.
From—		
India rubber and gutta percha—hard rubber	2,640	10,440
Elastic fabrics	8,580	27,300
Pelting	21,340	77,600
Rubberized fabric—pieces:		
For carding combs	8,140	38,025
Other forms:		
From—		
Great Britain	440	2,600
Boots and shoes—pairs:		
From—		
France	3,519	.....
United States	192	.....
Other countries	284	.....
Totals	3,995	25,967

Elastic webbing:	Elastic webbing:	
	POUNDS.	LIRE.
From—		
France	4,620	.....
Other countries	1,100	.....
Totals	5,720	44,200

Manufacturers of india rubber and gutta percha, n. e. s.:	From cut sheet:	
	POUNDS.	LIRE.
From cut sheet	220	2,200
Elastic fabrics	12,760	.....
Other countries	660	.....
Totals	7,920	72,000

Elastic fabric	Elastic fabric	
	POUNDS.	LIRE.
From—		
France	33,220	.....
Great Britain	213,620	.....
Argentina	880	.....
Other countries	660	.....
Totals	7,920	72,000

Elastic fabric	Tires and tubes:	
	POUNDS.	LIRE.
From—		
France	220	2,200
Great Britain	18,920	.....
Argentina	660	.....
Switzerland	22,660	.....
Egypt	4,620	.....
Brazil	880	.....
Other countries	6,380	.....
Totals	7,920	72,000

Tires and tubes:	Tires and tubes:	
	POUNDS.	LIRE.
From—		
France	102,520	.....
Great Britain	34,980	.....
Totals	137,500	975,000

Other manufactures:	Other manufactures:	
	POUNDS.	LIRE.
From—		
France	188,320	.....
Great Britain	38,040	.....
United States	22,880	.....
Other countries	230	.....
Totals	250,360	910,400

Total imports

..... 6,286,132

EXPORTS OF CRUDE AND MANUFACTURED RUBBER.

UNMANUFACTURED—	Two Months Ended February, 1918.	
	POUNDS.	LIRE.
India rubber and gutta percha—raw and reclaimed:		
To—		
Spain	128,700	.....
United States	25,300	.....
Totals	154,000	210,000

MANUFACTURED—	India rubber and gutta percha—threads:	
	POUNDS.	LIRE.
From—		
France	3,960	34,200
India rubber and gutta percha—sheets:		
Cut sheets	1,320	10,200
Elastic fabrics	4,400	12,000
Other forms, comprising hard rubber	3,960	15,300

India rubber and gutta percha—tubes:	India rubber and gutta percha—tubes:	
	POUNDS.	LIRE.
To—		
France	220	.....
Greece	12,760	.....
Spain	660	.....
Switzerland	660	.....
Egypt	3,740	.....
Argentina	7,920	.....
Brazil	14,960	.....
Chile	2,860	.....
Cuba	440	.....
Other countries	4,620	.....
Totals	48,840	355,200

Manufacturers of india rubber and gutta percha—n. e. s.:	Cut sheet:	
	POUNDS.	LIRE.
From cut sheet	220	2,200
Other countries	660	.....
Totals	7,920	72,000

Elastic fabric	Elastic fabric	
	POUNDS.	LIRE.
From—		
France	33,220	.....
Great Britain	213,620	.....
Argentina	880	.....
Other countries	660	.....
Totals	7,920	72,000

Elastic fabric	Other forms:	
	POUNDS.	LIRE.
From—		
Great Britain	1,100	.....
Other countries	1,100	.....
Totals	2,200	9,500

Other manufactures of india rubber:	From—	
	POUNDS.	LIRE.
France	15,180	.....
Great Britain	18,920	.....
Spain	1,540	.....
Switzerland	22	

EXPORTS OF INDIA RUBBER FROM MANAOS
DURING JUNE, 1918.

NEW YORK.

EXPORTERS.	Fine.	Medium.	Coarse.	Caucho.	Totals.
Bank of Brazil.....kilos	98,962	8,939	52,532	176,567	337,000
General Rubber Co. of Brazil.....	74,990	11,500	25,864	59,803	172,757
Tancredo, Porto & Co.....	42,331	38,131	.....	20,942	101,404
J. A. Mendes & Co.....	.....	.....	.....	69,552	69,552
Totals	216,283	58,570	78,396	326,864	680,113
In transit, Iquitos.....	9,872	7,318	9,836	67,936	94,962
Totals	226,755	65,888	88,232	394,800	775,075

1,455,246 kilos, consisting of 434,158 kilos fine, 14,429 medium and 6,659 coarse, were shipped to Pará, final destination unknown. Total shipments from Manaos were, therefore, 1,230,321 kilos.
(Compiled by Stowell & Co., Manaos.)

THE MARKET FOR RUBBER SCRAP.

Copyright, 1918.

NEW YORK.

THERE was a little more life in the rubber scrap market this past month than the one previous, one reason being the greater interest shown by the manufacturers in reclaimed rubber. The new regulations governing October-December rubber imports are practically the same, as far as tonnage is concerned, as during the last quarter. There is no doubt that, sooner or later, the available supply of rubber scrap will be drawn upon for emergency purposes.

BOOTS AND SHOES.—A small demand was noted in some quarters that was supplied at 8½ cents, although 8½ cents has been firmly quoted to reclaimers.

INNER TUBES.—The situation appears to be dormant and consumers have not shown interest of any sort in this market.

MECHANICALS.—These grades are in small demand, the movement being almost negligible, and prices unchanged.

TIRES.—The call has been hardly noticeable and for the most part limited to occasional lots of standard white tires. Prices are lower.

NEW YORK QUOTATIONS FOR CARLOAD LOTS DELIVERED.

SEPTEMBER 26, 1918.

Prices subject to change without notice.

BOOTS AND SHOES.	lb.	\$0.01 1/4 @ .01 1/4
Arctic tops.....	lb.	\$0.01 1/4 @ .01 1/4
Boots and shoes.....	lb.	.08 1/4 @ .08 1/4
Trimmed arctics.....	lb.	.07 @ .07 1/4
Untrimmed arctics.....	lb.	.06 @ .06 1/4

HARD RUBBER.

Battery jars, black compound.....	lb.	.02 @ .02
No. 1, bright fracture.....	lb.	.25 @ .26

INNER TUBES.

No. 1, old packing.....	lb.	.22 @ .22 1/2
new packing.....	lb.	.24 @ .24 1/2
No. 2.....	lb.	.11 1/2 @ .11 1/2
Red.....	lb.	.11 1/2 @ .11 1/2

MECHANICALS.

Black scrap, mixed, No. 1.....	lb.	.05 1/4 @ .05 1/4
No. 2.....	lb.	.04 @ .04
Car springs.....	lb.	.05 @ .05
Heels.....	lb.	.04 @ .04
Horse-shoe pads.....	lb.	.04 @ .04
Hose, air-brake fire, cotton lined.....	lb.	.05 1/2 @ .05 1/2
garden.....	lb.	.02 1/2 @ .02 1/2
Insulated wire stripping, free from fiber.....	lb.	.04 1/2 @ .04 1/2
Matting.....	lb.	.01 1/2 @ .01 1/2
Packing.....	lb.	.01 1/2 @ .01 1/2
Red scrap, No. 1.....	lb.	.09 1/2 @ .10
No. 2.....	lb.	.06 @ .06 1/2
White scrap, No. 1.....	lb.	.12 @ .12 1/2
No. 2.....	lb.	.09 @ .09

TIRES.

Pneumatic— Auto peelings, No. 1.....	lb.	.09 1/4 @ .09 1/4
No. 2.....	lb.	.06 1/2 @ .06 1/2
Bicycle.....	lb.	.04 1/2 @ .04 1/2
Standard white auto.....	lb.	.05 1/4 @ .05 1/4
Standard mixed auto.....	lb.	.04 1/2 @ .04 1/2
Stripped, unguaranteed.....	lb.	.04 1/4 @ .04 1/4
White, G. & G.....	lb.	.05 1/4 @ .05 1/4
M. & W. and U. S.....	lb.	.05 1/4 @ .05 1/4
Solid— Carriage.....	lb.	.05 1/4 @ .05 1/4
Irony.....	lb.	.02 @ .02
Truck.....	lb.	.05 1/2 @ .05 1/2

THE MARKET FOR COTTON AND OTHER FABRICS.

Copyright, 1918.

NEW YORK.

WITH the announcement from Washington, on September 14, that the Government proposed to fix cotton prices, the market broke suddenly and prices declined 120 to 140 points, an equivalent of \$6 to \$7 per bale. As the month progressed, the market recovered and assumed an upward tendency, due to favorable crop estimates and the appointment by the Government of price control committees who had the confidence of the trade. A month ago middling spot cotton was 37.30 cents, and on September 27 the quotation was 35.15 cents, the strength of the market being due to favorable news from the front.

The committee has announced that the price of raw cotton will not be fixed immediately and that sufficient time will be allowed to elapse to test the effect as a stabilizing influence of the work assigned to the Committee on Cotton Distribution.

Egyptian Cotton.—When the War Trade Board limited Egyptian cotton imports to 80,000 bales a year, and about 60,000 bales had already come in, there were 18,000 bales allocated to various importers. It now appears that this cotton has not been sold, indicating that the demand has fallen off about equally with the reduction of imports. It is well known that many tire manufacturers were forced to use combed Peelers and are continuing to do so, which accounts for a large amount of Egyptian cotton being released for other purposes.

Sea Island Cotton.—It is rumored that holders are trying to artificially maintain prices by withholding supplies. Average extra choice sells for 70 to 73 cents landed at New England mill points. Egyptian Sakellarides can be delivered for about 10 to 13 cents less, but is uncertain of shipment, which accounts for the premium on Sea Island.

Cotton Fabrics.—The Price Fixing Committee of the War Industries Board has postponed the revision of prices on cotton fabrics until November 16. In readjusting certain parities, however, to make them conform more nearly to their basic relations, the following changes were made in maximum prices, taking effect October 1, 1918, and subject to revision, with other cotton products, on November 16, 1918:

Wide and sail duck, 37 1/2 per cent discount from standard list.

Standard army duck, 31 1/2 per cent discount from standard list.

Hose and belting duck, 62 1/4 cents per pound.

Ten ounce hose duck, 64 1/4 cents per pound.

Class A, 28 1/2 cents per yard, card basis.

Class B, 28 cents per yard, card basis.

Class C, 27 1/2 cents per yard, card basis.

These classifications are described as follows:

Class A—To be duck made of white cotton without waste or strips, and counting not under 80 by 28. Also, qualities equal to Magnolia and Lindale to be in this class.

Class B—To be duck of all clean cotton, and counting not under 72 by 28. This class is recognized as the standard grade of single filling duck.

Class C—To be duck made to count not under 72 by 28, and containing not over 25 per cent of waste or strips.

Double filling duck:

Class A—Counting not under 80 by 28, 30 1/2 cents per yard, card basis.

Class B—Counting not under 72 by 28, 30 cents per yard, card basis.

NEW YORK QUOTATIONS.

SEPTEMBER 26, 1918.

Prices subject to change without notice.

AIRPLANE AND BALLOON FABRICS:	Wamsutta, S. A. I. L. No. 1, 40-inch.....	yard	None
	No. 4, 38 1/2-inch.....	yard	\$0.45 @

ASBESTOS CLOTH:

Brake lining, 2 1/4 lbs. sq. yd., brass or copper insertion.	lb.	.85 @
2 1/4 lbs. sq. yd., brass or copper insertion.	lb.	.90 @

BURLAPS:

32—7-ounce	100 yards	*17.15	@@
40—7½-ounce		*18.35	@@
40—8-ounce		*18.60	@@
40—10-ounce		*23.75	@@
40—10½-ounce		*24.00	@@
45—7½-ounce		*21.75	@@
45—8-ounce		*22.00	@@
45—9½-ounce		*27.75	@@
48—10-ounce		*35.00	@@

DRILLS:

38-inch 2.00-yard	yard	.30½ @	
40-inch 2.47-yard		.25½ @	
52-inch 1.90-yard		.32½ @	
52-inch 1.95-yard		.32½ @	
60-inch 1.52-yard		*.58	@@

DUCK:

CARRIAGE CLOTH:

38-inch 2.00-yard enameling duck.	yard	.31	@@
38-inch 1.74-yard		*.35	@@
72-inch 16.60-ounce		*.64	@@
72-inch 17-21-ounce		*.69½ @	

MECHANICAL:

Hose	pound	.62½ @	
40-inch, 10-ounce		.64½ @	
Belting		.62½ @	

HOLLANDS, 40-INCH:

Acme	yard	.30	@@
Endurance	yard	.33	@@
Penn	yard	.34	@@

OSNABURGS:

40-inch 2.35-yard	yard	.25½ @. 26½	
40-inch 2.48-yard		.24½ @. 25½	
37½-inch 2.42-yard		.24½ @. 26	

TIRE FABRICS

JENCKES SPINNING COMPANY

PAWTUCKET RHODE ISLAND

RAINCOAT FABRICS:

COTTON:

Bombazine 64 x 60 water repellent	yard	*.23	@@
60 x 48 not water repellent		*.20½ @	
Cashmeres, cotton and wool, 36-inch		.75	@@
blue and black		.90	@@
Oxford		.67½ @	
Twills 64 x 72,		*.30	@ .32½
64 x 102,		.35	@ .37½
Twill, mercerized, 36-inch, tan and olive		.35½ @	
blue and black		.45	.50
Tweed		.22	@@
Tweed, printed		*.21½ @	
Plaids 60 x 48,		.20½ @	
56 x 44,		.25	@ .32
Repp		*.21½ @	
Surface prints 60 x 48,		.23½ @	
64 x 60,			

IMPORTED WOOLEN FABRICS SPECIALLY PREPARED FOR RUBBERIZING

—PLAIN AND FANCIES:

63-inch, 3½ to 7½ ounces	yard	1.10	@ 2.90
36-inch, 2½ to 5 ounces		.80	@ 1.80

IMPORTED PLAID LINING (UNION AND COTTON):

63-inch, 2 to 4 ounces	yard	.90	@ 1.60
36-inch, 2 to 4 ounces		.52½ @	1.05

DOMESTIC WORSTED FABRICS:

36-inch, 4½ to 8 ounces	yard	.70	@ 1.70
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DOMESTIC WOVEN PLAID LININGS (COTTON):

36-inch, 3½ to 5 ounces	yard	.27½ @	.50
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SHEETINGS:

40-inch 2.35-yard	yard	*.28½ @	
40-inch 2.50-yard		*.27½ @	
40-inch 2.70-yard		*.24½ @	
40-inch 2.85-yard		*.21½ @	
40-inch 3.15-yard		*.22½ @	
40-inch 3.60-yard		*.19½ @	

JACKET:

Delaware	yard	.30	@@
Schuylkill	yard	.35	@@

SILKS:

Canton, 38-inch	yard	.35½ @	
Schappe, 36-inch		.52½ @	

STOCKINETTES:

COTTON, 52-INCH:

D—14-ounce	yard	*.85	@@ .90
E—11½-ounce		.60	@@ .65
F—14-ounce		.85	@@ .90
G—8-ounce		.75	@@ .80
H—11-ounce		.70	@@ .85
I—9-ounce		.60	@@ .65
Knithack	pound	*1.75	@ 2.00

WOOL, 52-INCH:

A—14-ounce	yard	*1.75	@@
B—14-ounce		*2.25	@@
C—14-ounce		*2.50	@@

TIRE FABRICS:

17½-ounce Sea Island, combed	square yard	1.60	@ 1.70
17½-ounce Egyptian, combed		1.30	@ 1.40
17½-ounce Egyptian, carded		1.20	@ 1.30
17½-ounce Peeler, combed		1.10	@ 1.15
17½-ounce Peeler, carded		1.00	@ 1.05

*Nominal.

SEA ISLAND CROP 1917-1918.

	Receipts 1917- 1918.	Receipts 1916- 1917.
Stock on hand, August 1, 1917—Savannah, 1,043; Charleston, 1	1,044	2,508
bales	32,022	47,499
Received at Savannah (net)	6,971	3,495
Received at Charleston (net)	40,146	43,080
Received at Brunswick (net)	300	1,914
Received at Norfolk (net)		
Received at interior points and shipped direct to southern mills	7,856	17,121
	88,339	115,617
Less Total Exports	62,559	114,573
Stock, July 31, 1918—Savannah, 15,247; Charleston, 517;	25,780	1,044
Jacksonville, 10,016	92,501	117,544
Crop grown according to final ginners' report		

EXPORTS AND RESHIPMENTS, 1917-1918.

From—	Great Britain.	Continent.	Northern Mills.	Southern Mills.	Twice.	Totals.	Reshipped to Other Ports and Counted
							Reshipped to Other Ports and Counted
Savannah	427	142	15,253	2,164	293	18,279	
Charleston	...	...	4,619	1,390	461	6,470	
Jacksonville	...	...	30,408	...	...	30,408	
Brunswick	300	...	...	...	...	300	
Interior points	...	...	7,856	...	...	7,856	
	727	142	50,280	11,410	754	63,313	
Less cotton counted twice...	...	...	...	...	754	754	
	727	142	50,280	11,410	...	62,559	

COMPARATIVE STATEMENT OF EXPORTS FOR PAST SIX YEARS.

	1912-1913.	1913-1914.	1914-1915.	1915-1916.	1916-1917.	1917-1918.
Great Britain	bales 10,914	11,749	1,922	1,667	1,423	727
Continent	5,161	4,833	1,991	1,060	173	142
Domestic, northern mills...	29,451	67,636	60,879	60,822	88,496	50,280
Domestic, southern mills...	10,492	14,427	15,409	21,697	24,367	11,410
Burned	...	...	...	...	114	...

56,018 98,645 80,201 85,246 114,573 62,559

COMPARATIVE STATEMENT OF CROP GROWN FOR PAST SIX YEARS.

	1912-1913.	1913-1914.	1914-1915.	1915-1916.	1916-1917.	1917-1918.
South Carolina	bales 8,375	8,670	5,590	6,178	3,486	7,313
Georgia and Florida	65,266	68,820	76,008	85,742	114,058	85,188

73,641 77,490 81,598 91,920 117,544 92,501

(Compiled by John Malloch & Co., Savannah, Georgia.)

THE MARKET FOR CHEMICALS AND COMPOUNDING INGREDIENTS.

Copyright, 1918.

NEW YORK.

THE Market on the base metals has been steady and strong. The Lead Producers' Committee has assumed complete control on lead by request of The War Industries Board. This amounts to governmental fixing of the price.

There is considerable demand for tin with little available to sell.

The price for copper after November 1 is a matter of speculation, depending on the sufficiency of the supply needed to fill the war demands.

CAUSTIC SODA.—Prices have not yet been fixed by government authority. The war needs require practically one-quarter of the country's production in the production of cleaners and explosives.

BARYTES.—Southern producers consider an advance in price inevitable in the near future owing to increased cost of production.

LITHOPONE has been advanced for carload lots for the last quarter of this year. The spot market is 8½ cents per pound. In anticipation of more restrictions by the Government, pigment manufacturers look for standardization and discontinuance of special brands.

ZINC OXIDE is in large demand and no increase of price is asked for the last quarter of the year.

SOLVENTS.—The country's stock of gasoline is said to be reduced to two or three weeks' supply, the amount consumed in September being of record proportions to be exceeded, no doubt, by the war demands of next Spring. The shortage will be serious for the rubber trade catering to civilian uses, with little prospect of relief through use of other solvents.

Presidential control of raw materials authorized by a recently enacted bill will affect rubber manufacturers as to supply of several rubber compounding ingredients in common use, such as antimony and magnesia products, chalk, fuller's earth, kaolin, graphite, mica and sulphur.

NEW YORK QUOTATIONS.

SEPTEMBER 26, 1918.

Prices subject to change without notice.

ACCELERATORS, ORGANIC.

Accelerator N. C. C.	lb.	.50	•
Accelerene	lb.	*2.62	•
Acetone	lb.	.80	•
Acetone No. 2	lb.	*.80	•
Accelerator No. 1	lb.	.60	•
Aldehyde ammonia crystals	lb.	1.00	• 1.10
Aniline oil	lb.	.29	•
Annex	lb.	1.25	•
Duplex	lb.	.75	•
Exceller	lb.	.85	•
Hexamethylenetetramine (Vitalin)	lb.	.65	•
Hexamethylene tetramine (powdered)	lb.	1.05	• 1.20
Paraphenylenediamine	lb.	3.00	•
Tensilite	lb.	.60	•
Thiocarbonanilide	lb.	*.50	•
Velocite	lb.	.50	•
Vitaminex	lb.	.65	•

ACCELERATORS, INORGANIC.

Lead, dry red	lb.	.11 1/4	@
sublimed blue	lb.	.09 1/4	@
sublimed white	lb.	.09 1/4	@
white, basic carbonate	lb.	.10	•
white, basic sulphate	lb.	.09 1/4	• .09 1/4
Lime, flour	lb.	.02	• .02 1/2
Litharge, domestic	lb.	.10 1/4	•
English	lb.	*.15	• .16
sublimed	lb.	.11	•
Magnesium, carbonate	lb.	.12	•
calcined, heavy (Thistle brand)	lb.	.12	•
light (Manhattan brand)	lb.	.50	•
Magnesium oxide	lb.	.06 1/4	@
Magnesite, calcined, powdered	ton	*65.00	•

ACIDIC.

Acetic, 28 per cent (bbis.)	lb.	.05	• .06
Glacial, 99 per cent (carboys)	lb.	.21	•
Cresylic, 97-99 per cent, straw color	gal.	1.12	•
95 per cent, dark	gal.	1.02	•
Muriatic, 20 degrees	lb.	.02 1/4	• .02 1/2
Nitric, 36 degrees	gal.	7.35	•
Sulphuric, 66 degrees	gal.	.21	•

ALKALIES.

Caustic soda, 76 per cent, ground	lb.	.08	•
Soda ash, light, 58 per cent in bags	lb.	.04	•

COLOURS.			
Black:			
Bone, powdered	lb.	.05	•
granulated	lb.	.09	•
Carbon, black (sacks, factory)	lb.	.14	•
Ivory black	lb.	.16	• .30
Lamphblack	lb.	.15	• .45
Oil soluble aniline	lb.	*.75	• 1.50
Rubber black	lb.	.06	•
Blue:			
Cobalt	lb.	.35	•
Prussian	lb.	1.35	• 1.50
Ultramarine	lb.	.18	• .50
Brown:			
Iron oxide	lb.	.03	• .04
Ochre, domestic	lb.	.03	• .04
imported	lb.	.06	•
Sienna, raw and burnt	lb.	.05 1/4	• .07
Umber, raw and burnt	lb.	.05 1/4	• .07
Green:			
Chrome tile	lb.	*.15	•
Oxide of chromium (casks)	lb.	*.85	•
India rubber	lb.	.75	•
Red:			
Antimony, crimson, sulphuret of (casks)	lb.	.50	•
crimson, "Mephisto" (casks)	lb.	.60	•
Antimony, golden, sulphuret of	lb.	.25	•
golden, "Mephisto" (casks)	lb.	.30	•
golden sulphuret, States brand, 16-17%	lb.	.28	•
golden sulphuret, States brand	lb.	.25	•
red sulphuret, States brand	lb.	.55	•
vermilion sulphuret	lb.	.45	•
Arsenic, red sulphide	lb.	.08	• .12
Indian, pure bright	lb.	.12	•
Iron oxide, reduced grades	lb.	.15	• .17 1/2
pure bright	lb.	2.50	• 3.00
Oil soluble aniline, red	lb.	2.00	•
orange	lb.	*.18	•
Oxymony	lb.	.02 1/4	• .06
Venetian	lb.	2.00	• 2.16
Vermilion, English, pale, medium, dark	lb.	.08	•

Aluminum bronze powder	lb.	.80	•
Lithopone, imported	lb.	.06	• .06 1/2
domestic	lb.	.08	• .08 1/2
Ponolith (carloads, factory)	lb.	.07 1/4	• .08
Rubber makers' white	lb.	.08	• .08 1/2
Zinc oxide, Horsehead (less carload, f. o. b. factory):			
"XX red"	lb.	.10 1/4	•
"Special"	lb.	.11	•
French process, red seal	lb.	.13 1/4	•
green seal	lb.	.13 1/4	•
white seal	lb.	.14 1/4	•
(States brand)	lb.	.10 1/2	• None
Zinc sulphide, pure	lb.		

Yellow:

Cadmium, tri-sulphate	lb. 2.68	@
sulphide	lb. 2.00	@
Chrome, light and medium	lb. .28	@ .32
India rubber	lb. *1.00	@
Ochre, light or dark	lb. *.02%	@
Oil soluble aniline	lb. *2.00	@
Zinc chromate	lb. *.50	@

COMPOUNDING INGREDIENTS.

Aluminum flake (bbls. factory. Less 5% carload)	ton 29.00	@
Aluminum oxide (sacks factory. Less 5% carloads)	ton 26.00	@
Ammonia carbonate, powdered, lumps	lb. *.18	@
Asbestine (bags)	lb. *.14	@ .14½
Asbestos (bags)	ton *22.50	@ 25.00
Barium, carbonate, precipitated, sulphide, precipitated	ton *25.00	@ 35.00
Barytes, pure white, off color	ton 65.00	@
uniform floated (f. o. b. factory)	ton 33.00	@ .09
Basofor	ton 23.00	@ 28.00
Blanc fixe	ton 35.00	@
Bone ash	ton 110.00	@
Chalk, precipitated, extra light, precipitated, heavy	lb. .05	@ .05½
China clay, domestic	ton 15.00	@ 22.00
Cotton linters, clean mill run, f. o. b. factory	bale 4.67	@
Fossil flour	ton 60.00	@
Glue, high grade, medium, low grade	lb. .40	@ .50
Graphite, flake (400 pound bbl.) amorphous	lb. .25	@ .35
Ground glass FF. (bbls.)	lb. .14	@ .20
Infusorial earth, powdered, bolted	ton 10.00	@ .25
Mica, powdered	ton 60.00	@
Plaster of Paris	ton 65.00	@ .06
Plastigum	lb. 2.00	@ 3.00
Pumice stone, powdered (bbl.)	lb. .15	@
Rotten stone, powdered	lb. .04	@ .08
Rubber flux	lb. .02½	@ .04½
Rubhicle	lb. .15	@
Silex (silica)	ton *38	@
Soapstone, powdered, domestic, imported	ton 22.00	@ 40.00
Starch, powdered corn (carload, bbls.) (carload, bags)	ton 15.00	@ 25.00
Talc, American, French	ton 65.00	@ 80.00
Tripoli earth, powdered, bolted	ton 60.00	@
Tyre-lith	ton 65.00	@ 80.00
Walnole rubber flux	lb. .06	@
Whiting, Alba (carloads), commercial	cwt. .90	@ 1.00
gilders	cwt. 1.25	@ 1.35
Paris, white, American	cwt. 1.30	@ 1.35
English cliffstone	cwt. 1.50	@ 1.75
Wood pulp XXX	ton 4.80	@

MINERAL RUBBER.

Gilsonite	ton 55.00	@
Genasco (carloads factory)	ton 35.00	@ 57.00
M. R.	ton 65.00	@
M. R. X.	ton 100.00	@
Liquid rubber	lb. *.14	@ .15
Pioneer, carload, delivered, less carload, factory	ton 55.00	@
Richmond, Bi and No. 64 Brand	ton 60.00	@
Refined Elaterite	ton 75.00	@
Raven M. R.	ton 65.00	@
ton 175.00	@	
ton 50.00	@ 70.00	

OILS.

Corn, crude, refined	lb. .18	@
Glycerine (C. P. drums)	lb. .21	@
Glycerole	lb. .61	@ .62
Linseed, raw (carloads)	lb. .18	@
Linseed compound	gal. 1.80	@ 1.90
Palm	gal. *1.00	@
Paraffin	gal. *.18	@
Petrolatum	gal. *.27	@
Petroleum grease	lb. *.08½	@
Pine, steam distilled	gal. *.55	@
Pine tar	gal. *.35	@
Rapeseed, refined, blown	gal. 1.75	@
Rosin	lb. .25	@
Soya bean, crude	lb. .74	@ .92
Tar (cases)	lb. .18	@
gal. .35	@ .37	

SOLVENTS.

Acetone (drums)	lb. .25½	@ .30
substitute (drums)	gal. 2.00	@
Benzol, 90 per cent	gal. .22	@ .27
Beta-naphthol, resublimed	lb. 1.00	@
ordinary grade	lb. .70	@
Halowax oil No. 1000 (f. o. b. Wyandotte)	lb. .30	@
No. 1001 (f. o. b. Wyandotte)	lb. .35	@

Naphtha, motor gasoline (steel bbls.)	gal. .24½	@
73 @ 76 degrees (steel bbls.)	gal. None	
68 @ 70 degrees (steel bbls.)	gal. None	
V. M. & P. (steel bbls.)	gal. 23½	@
Toluol, pure	gal. 1.55	@
Turpentine, spirits	gal. .66	@
wood	gal. .57	@ .63
Venice	lb. .65	@ .66
Zylo, pure	gal. .35	@
commercial	gal. .45	@ .55
commercial	gal. .30	@ .35

SUBSTITUTES.

Black	lb. .11	@ .18
White	lb. .13	@ .25
Brown	lb. .18	@ .24
Brown fastice	lb. .10	@ .23
Whits fastice	lb. .14	@ .25
Cordex	lb. .45	@
Energine	lb. .30	@
Paragol soft and medium (carloads)	cwt. 17.08	@
hard	cwt. 16.38	@
Toughenite	lb. .40	@

VULCANIZING INGREDIENTS.

Carbon, bisulphide (drums)	lb. .08½	@ .10
tetrachloride (drum)	lb. .20	@ .30
Lead, black hyposulphite (Black Hypo)	lb. None	
Orange mineral, domestic	lb. .14½	@
Sulphur chloride (drums)	lb. *.07½	@ .08
Sulphur, flour (carloads)	cwt. 3.90	@
pure soft (carloads)	cwt. 3.95	@

(See also Colors—Antimony)

RESINS AND PITCHES.

Cantella gum	lb. .65	@
Pine tar, retort, kiln	gal. *.28	@
Pitch, Burgundy	gal. *.25	@
coal tar	lb. *.07	@
pine tar	lb. *.01½	@
ponto	lb. *.02½	@
Resin, Pontianak, refined	lb. *.12	@
granulated	lb. None	
fused	lb. None	
Rosin, K.	lb. *.04½	@
Shellac, fine orange	lb. *.78	@ .82
Tar, kiln	bbd. 13.00	@

*Nominal.

THE MAAS LATEX CUP.

A new latex cup which, it is claimed, does not retain rain-water, has been invented by Mr. Maas of the General Experiment Station of the A. V. R. O. S. (East Coast of Sumatra Rubber Planters' Association).

The cup consists of two parts: (1) the cup proper, which is of the usual type, but has a small piece of the rim cut out, by way of overflow: (2) a piece of metal—aluminum, tin or zinc, bent to resemble half a funnel, and provided with two ears by means of which it is adjusted to the cup in front of the overflow.

The cup is placed in such a way that the funnel-shaped opening is immediately under the tapping channel, so that the issuing latex enters the cup by the funnel. In case of rain, the water dripping from the trunk will enter the cup in the same way, and will continue to flow into the cup until the level on both sides of the funnel has risen to the overflow, when the rain-water will escape by this opening. The difference in specific gravity of water and latex will cause the latter, which is the lighter fluid and is separated from the overflow by means of the funnel wall, to remain in the cup.

Owing to the dry weather prevailing, no extensive experiment has been possible, but trial on a small scale with a simulated shower proved entirely satisfactory.



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